

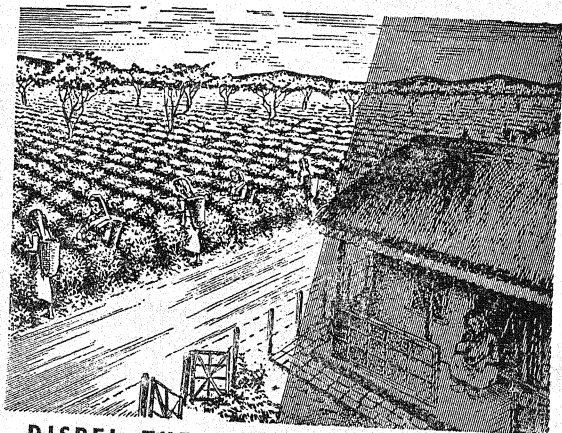
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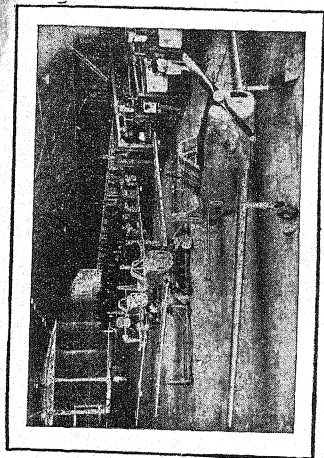
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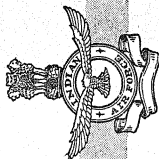
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The Journal of the United Service Institution of India

Vol. LXXXV OCTOBER-DECEMBER 1955 361

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EDITORIAL NOTES

The SRC Report

Whatever be the final outcome of the recommendations contained in the States Reorganisation Commission's Report, the publication of this important document has provided a sound basis from which the whole question can be viewed and studied. While the appointment of the Commission was largely the result of the demand for linguistic states, this was by no means the sole criterion for the Commission's findings. Economic viability, administrative convenience and the wishes of the people concerned had also to be taken into account. Above all the unity and security of the country as a whole had to be kept in view.

Among the Commission's recommendations are the reduction in number of the existing twenty-seven states to sixteen, simultaneously abolishing the class system of A, B and C class states. Delhi, Manipur and the Andamans are to be centrally administered territories.

For a country the size of India, it is only natural that owing to geographical and historical factors there are certain cultural groups which can be identified by particular regional

languages. Even if the principle of unilingual states is accepted it would be difficult to apply it uniformly to all these areas without upsetting the administrative and economic equilibrium which has to be maintained in the component states of the Union. Hence the solution to the problem will lie in a broader approach and a large measure of give and take.

Re-demarcation of boundaries will involve a pruning and grafting process. Such a surgical operation when undertaken has to ensure that healing will follow naturally. The cure for any maladjustment will be easier to achieve if regional interests are subordinated to the national interests.

Two copies are required of all articles sent to the Editor. These should be typewritten with double-spacing, and on one side of the paper.

STATES REORGANISATION

THE BACKGROUND OF THE PROBLEM

K.M. PANIKKAR

Lecture on Thursday 17th November 1955

[With Major-General J.N Chaudhuri, OBE, in the Chair]

THE CHAIRMAN: Introducing a speaker like Sardar Panikkar is one of the easiest jobs that one has to do because he needs no introduction to anyone. As you know, he is not only a distinguished historian, but also a distinguished diplomat and a distinguished leader of political thought. Today he is going to tell us what lay behind the scenes of the proposals of the States Reorganisation Commission, a report which must have a tremendous effect on modern India.

LECTURE*

This is in pursuance of my promise last time that when the atmosphere has settled down a bit after the publication of the States Reorganisation Commission's Report, I should be glad to come and explain to you the background of the proposals which we have placed before the Government for the reorganisation of the States and Units of India. You have only to look at the map of India as it is to see how strangely we are organized. There are many reasons for this rather haphazard grouping of units which were known under the British regime as 'major provinces' and 'minor administrations.' As you will remember, the East India Company had certain control outposts on the sea coasts, *e.g.* Bombay, Madras and Calcutta, from where they moved in to areas which they thought were profitable for their mercantile adventure. In consequence, their territorial aggrandizement except so far as the Gangetic Valley was concerned, was one of putting together the coastal territories, leaving the interior under the authority of the Indian rulers, so that actually two-fifths of India were left to be administered by semi-independent Princes. Only

* This is not a verbatim record but a summary of the lecture which will be of interest as a study of the historical background of the problem which faced the States Reorganisation Commission, of which the speaker was a member, irrespective of any final decision taken on the Commission's recommendations. (Ed.)

in Bengal, the Gangetic Valley and the Punjab, did the British territories form one continuous area. On the other hand, if you look at the map again from the Bhawalpur border to the Orissa coast, you will see the whole area marked "yellow" which means that they were not under direct British authority. Generally speaking therefore the organisation of provinces in India under the British, was according to a pattern, by which they directly controlled the coastal territories, leaving the interior to the administration of the Indian rulers, keeping to themselves the fertile Gangetic valley and the Punjab which was annexed later. Originally, as you know, there were three Presidencies but their territorial structure was haphazard and administratively they were cumbersome.

As early as 1903, Lord Curzon came to the conclusion that the provincial organisation was unsystematic and administratively cumbersome, leading to inefficiency and wastage. At his instance Sir Hubert Risley issued the famous circular which first brought the question of the rationalisation of Indian provinces to the forefront. But the basis that Curzon adopted in regard to Bengal was unfortunately motivated not merely by administrative convenience, but also by a desire to placate the Muslims. This led to unexpected difficulties. The next time the reorganisation was done on a slightly different basis. Bihar was separated from Bengal and with Orissa was constituted into one province. Bengal was reunited and Assam became a separate province. So, the first reorganisation was over by 1911 when the Durbar was held.

Apart from the administrative difficulties felt by our rulers the people themselves began from 1911 to ask for the States to be organised on a linguistic basis. The first claim in respect of this came from the Andhras who alleged that their association with the more advanced Tamils was detrimental to their interests, and that in any case on the basis of a separate language, history and tradition they should be organised as a separate province. The movement for a reorganisation of states gained much greater impetus when Gandhiji took over the organisation of the Indian National Congress. He came to the basic conclusion that the national movement could be stepped up only by harnessing the strength of regionalism and consequently the Congress accepted in principle the linguistic redistribution of provinces. The Congress Provinces were created on a linguistic basis. The basic doctrine of Gandhiji was that if you want a national movement in India, then it must be based on units which are harmonious and are able to mobilise the people of the area behind the

national claims. So the Congress provinces were organised on broadly linguistic lines. But it was not possible to give full effect to this idea as the territories of the Princes intervened to break up linguistic groupings. Thus out of the 18 million Malayalam speaking people, over 8 million were in the states of Travancore and Cochin; in the Karnataka region with its population of 19 million, 8 million were in Mysore. The Andhras, Marathas, Gujeratis and others were also divided up in this manner rendering it impossible for the Congress to follow the principle to its logical conclusion. But the principle was accepted and broadly speaking the Congress units were reconstituted on that basis. The principle also found support in the report of the Nehru Committee which was the first major contribution to political and constitutional thinking in India. With independence however a new situation developed. India had to face many grave problems, especially those arising from the partition of the Country. Millions of refugees had to be settled. The food position was menacing. Serious military operations were going on in Kashmir. The Administrative ability of the new state was strained to the limit and the national leaders naturally felt that it would be unwise to tackle the problem of the reorganisation of the units at that stage. It had therefore to wait.

A new factor, simplifying the issue in some ways, but in others adding to its complexity, also came into this problem by the integration of the Princely states. Three methods were followed in this regard. Some of the States were absorbed in the old Indian Provinces; some were grouped to become centrally administered units and other were organised into a new type of states. The administrative problems presented by these groupings were extremely complicated as a uniform machinery had to be evolved out of various stages of administrative development. Also the political leadership in these areas was very weak rendering the problem of democratic government extremely difficult.

When the Constitution was framed, the State structure of our federation had unusual characteristics, as our federation had four different kinds of units, a system which existed nowhere else. In the United States, for example, there were the states and the territories, but no division between A, B, and C class states. The two such territories in the United States are Alaska and Hawaii Islands.

There are four different types of States in India. The first class of States are what are known as Part A States contained in Schedule A

of the Constitution—the ex-Provinces of British India which had a satisfactory administrative system. They are entrusted with the same powers, and their relations with the centre are those of normal federal units. Then come the Part B States enumerated in Schedule B which have three special characteristics, though in other things their powers are the same as Part A States. The first is that, instead of a Governor, there is a Rajpramukh at the head of the State. Secondly the Central Government has the right to issue directives to their Governments. If the Central Government disapproves something done by a Part B State, then the President, on the advice of the Government, can issue a directive which would have the authority of law. Thirdly, under the federal financial agreement, their finances have been supported by a system of compensatory grants to enable them to adjust their taxation and revenue systems to those of A Class States.

Part C States were either historical anachronisms or survivals of British idiosyncrasies. Coorg, Ajmer-Merwara and Bhopal are examples of this kind of museum-piece states. Ajmer was a Moghul base for action against the turbulent princes of Rajasthan to keep the Rajputs in order. The British continued that policy and when the integration of states took place Ajmer was left alone to be dealt with later.

The Island group of Andamans and Nicobars constitute the fourth class of states. Thus it will be seen that the map of India after independence was something of a jigsaw puzzle.

It was also becoming increasingly clear that if the system were allowed to be stabilised it would not be possible at a later date to re-organise the States on a rational basis. Vested interests had grown up which equated the separateness of the states with national interests.

The necessity for reorganisation had also been brought home in a number of other things also. One was the great State of Hyderabad. The unity of Hyderabad was based on the authority of the Nizam and the enforcement of the Urdu language. Once the authority of the Nizam and the imposition of Urdu language ceased, the Marathwada area could be administered only in Marathi, the Telengana area in Telugu and the Karnataka area in Kanarese.

The problem of the state structure of the Union had therefore become an emergent one. If a federation is to work satisfactorily, then its state structure has to be on a rational basis. Also the Government

began to realise that unless the administrative machinery of these different areas was integrated and improved, there could be no impetus to planning and economic development. This was the reason for the appointment of the States Reorganisation Commission.

In dealing with this question, the Commission had to take into account not merely the boundaries of the States but also numerous other factors, such as the unity of India and its security, the necessity to have compact and homogeneous units, the effect of changes on planning etc.

Our Union is so constituted that only the Centre is indestructible and not the states. The states are not independent units whose areas and composition are considered inviolable. Under Section 3 of the Government of India Act, their consent is not necessary for altering their boundaries. The Constituent Assembly in framing the Constitution foresaw the desirability of changing the provincial structure, if the people felt it necessary to do so. Again the problem of creating harmonious and compact units had to be considered in the light of our special conditions. Our democracy is based on adult franchise and 80 per cent of the electors are illiterate. They can only speak their mother tongue. Now with adult franchise the tendency would inevitably be to elect people more and more in touch with the masses and consequently more approximating to their level of education. In the province of Madras today there are 280 members from the Tamil country. Even the Chief Minister speaks only Tamil. In a democracy, Government has to be carried on by discussion every legislation has to be discussed in the legislature; everything has to be done by moral persuasion, and for all these, you have got to depend on a language. The importance of linguistic consideration in the reorganisation of the states will be apparent. I will illustrate this by an example. In Madras, I noticed that about 25 seats, probably more, had been captured by a community of small proprietors and agricultural labourers who, as a result of the adult franchise, had suddenly become politically important. They represent the genuine rural community of the south. It is not possible for them to carry on their affairs in any language except their own—Tamil. This has happened practically every where in India. So it was necessary from the administrative point of view and the integration of the people to have a uni-lingual state as far as possible; that is to say, a State in which one language is predominant.

We also felt that there was no justification for the different categories of States. If the B Class states were to go, they would have to be integ-

rated with states which had a basically sound administration. In most 'B' Class states the new Civil Services did not receive proper training. Formerly an I.C.S. officer went through a period of ten years' tutelage before he was given independent charge. He was trained and was initiated into the art of administration. But the I.A.S. officers in B Class states were given only nominal training and had to shoulder major responsibilities.

So, from the point of view of efficiency of administration, our idea was that the B Class should be merged in the adjacent A States wherever possible, e.g. Saurashtra in Bombay, the States of PEPSU in the Punjab and the State of Madhya Bharat into the nearest area which can handle it.

In regard to the Bombay State, we received different proposals. The immediate issue was in regard to the City of Bombay. We did not consider it desirable to establish Bombay as a separate city State. It had in our opinion to be a part of a larger territorial unit. Its incorporation in Maharashtra did not seem to us feasible because of various reasons. It would have in the first place led to a financial crisis with disastrous results to the country. So we had to evolve a scheme by which this problem could be solved and the suggestion that we made was that the Marathwada area of Hyderabad, Saurashtra and Kutch should be merged in the present State of Bombay. Under the scheme, the Maharashtrians would have a clear majority of 20 seats in the legislature.

The only issue which concerned the defence of the country related to outlying areas. We recommended therefore that such areas should remain territories directly administered by the Centre. The first is, of course, the Andaman and Nicobar Islands. It was important to us that these should be developed in such a way as to meet our defence requirements. The State of Manipur, apart from other considerations, is a border State and as such it should be directly administered by the Centre. The same is also the case in respect of the North-East Frontier Agency because of its special position.

Our proposals regarding the reorganisation of Civil Departments, the projection of Central Authority in a number of technical posts in the states etc. have not attracted much public attention so far.

That is the background of the problem.

THE CHAIRMAN: I would like to thank Sardar Panikkar for a very illuminating talk on the historical background of this problem. (Applause)

THE IMPERIAL DEFENCE COLLEGE COURSE

BRIGADIER C.R. MANGAT-RAI

THE idea of setting up the Imperial Defence College was first conceived in the versatile brain of Sir Winston Churchill. At the end of World War I he realised the need of improving the machinery for the higher direction of the national war effort. The war of 1914-18 had been a foretaste of total war. For the first time, even if on a small scale, casualties were suffered by civilians and there was material destruction well behind the fighting fronts. All departments of life in the nation were affected by the war and were drawn into contributing to the sum total of effort needed for victory. He saw that those taking part in strategic planning and direction must possess, besides a specialised knowledge of their own province, a sound understanding of all other aspects of the national effort. He foresaw that in future there would be a vital need for joint staffs such as had never existed before, trained in and capable of coordinating the plans and activities of the three fighting services and of relating them to the civil resources available to support them. In 1922 Mr. Winston Churchill, as Secretary of State for the Colonies, while presiding over a cabinet committee, proposed that the government should set up a special ad hoc committee to draw up a scheme for a joint service college where senior and carefully chosen officers and officials, drawn from all parts of the Commonwealth, could undertake joint studies of the many problems involved in the higher direction of British Commonwealth defence. This proposal was accepted and a committee was formed under the presidency of Mr. E.F. Wood (now Lord Halifax). Their recommendation for the establishment of an Imperial Defence College was accepted after some delay and the college came into being in 1927.

The continued need of such a college was forcefully borne out by experience in World War II, which indeed was total war. The value of its past existence in the inter-war period was proved by the distinguished part played in the war by past students in key appointments all over the world. At the end of hostilities there was complete unanimity among the governments and services of the Commonwealth that the college should

resume its work. In 1946 the Imperial Defence College reopened under Field-Marshal Sir William Slim.

The syllabus covered by the present course is briefly as follows :

- (a) The current political, economic and military situation in different parts of the globe.
- (b) Foreign policy and Commonwealth relations with foreign powers.
- (c) The scientific, economic, social, industrial and financial resources of the Commonwealth and her allies for peace and war.
- (d) Organisation and problems of the fighting and civil defence services of the Commonwealth.
- (e) The organisation required for the higher direction and control of the war effort of the Western allies and in particular the part of the Commonwealth in that effort and the machinery for directing the Commonwealth effort.
- (f) Current strategic problems facing the Western allies and in detail the impact of these problems on the Commonwealth.

In the present world situation in which there are two big power blocs in opposition the word 'Imperial' in the designation of the college has become a misnomer. The central subject of study is not imperial but Western defence. The Commonwealth part in that defence is, however, studied in greater detail.

The IDC is situated in Seaford House in Belgrave Square, London, a house belonging to Lord Howard de Waldon which, at one time, he used for entertaining friends, but which in a welfare state he can no longer afford to use for that purpose. The course, consisting of about sixty officers, runs from January to December each year. About two-thirds of the students are British officers and officials, drawn from the three services, the civil service, the foreign service, the Colonial service and the defence science organisation. The remaining officers come from Commonwealth countries, again all three services and civilian officials being represented. The services officers are usually of Brigadier or equivalent rank. A recent feature has been the inclusion of officers from the US forces and the State Department, an arrangement which cannot unfortunately be reciprocated at the US National War College by the inclusion of Commonwealth

officers because of American statutory security restrictions. Students have to make their own living arrangements and they suit their taste as to whether to live in London or the country. Most of the students coming from abroad prefer to live in London as this makes it easier to attend theatres, social functions and generally to take a part in those extra-curricular activities that form a valuable supplement to their IDC education.

The Commandant of the college is a Lieut-General or of equivalent rank from the other two services. The appointment has a tenure of two years and is held in turn by the three services. Under the Commandant there are the senior and junior directing staff consisting of, for the former, four officers on the Maj-General level, three being from the three services and one a civilian and, for the latter, four officers of Lieut-Colonel level. There is, besides, a small administrative staff. The course is divided into three terms, spring, summer and autumn with short breaks dividing the spring from the summer term and the summer from the autumn term.

The normal day's routine at the college is that students arrive at 10 a.m. and the day's lecture begins at 10.15 a.m. (10.30 a.m. on Mondays). The lecture lasts for an hour and then there is a fifteen minute break for coffee. There follows a discussion with the lecturer when students have the opportunity of questioning him and advancing their own views. This continues till lunch time. After lunch the students work in syndicates on the problem in hand. The size of syndicates is normally 7 or 8 students and their composition is made as representative as possible of the three services and civilians from home and abroad. Syndicates are allowed two to three weeks for each problem. Officially the college closes at 5 p.m. but actual afternoon working hours depend upon the syndicate leader. There is a NAAFI mess in the college where students can have lunch and afternoon tea. College remains in session for a five day week, Monday to Friday.

Work in college has deliberately been given a leisurely tempo so as to allow students, probably for the first and last time in their service careers, time in which to read, think and discuss. There is an excellent library on current and military affairs in the college and it is kept up to date with the latest books and journals. Although written solutions to problems are required, it is to full discussion of the subject that importance is attached. The sum total of experience of individual members

of syndicates is considerable both in variety and extent and it is emphasised that the best value from the course is to be derived by bringing out the lessons learnt from that experience through discussion. The agreed written solution to the problem that emerges from discussion makes an interesting record for students to keep.

The first two terms are devoted to background studies. The current political, military, economic and social position in different parts of the world is studied, and the latest developments in science and technology are examined. In the last term attention is turned to problems of the three services and to global strategy. The Commonwealth's part in allied plans for attaining strategical aims in peace and war are studied in greater detail.

All lectures are given by visiting lecturers. The central position of the IDC in the British capital and principal city of the Commonwealth makes it possible to obtain some of the best authorities to speak on each subject. Lectures are given by cabinet ministers, ambassadors, Commonwealth High Commissioners, service chiefs of staff, heads of government departments, naval, military and RAF commanders, civil servants, university professors and lecturers together with leading political theorists, members of the church, economists, writers, businessmen, trades union officials, scientists and specialists on the particular problem under consideration. (Appendix A gives a list of lecturers for 1955)

It has become a tradition for lecturers to speak freely and frankly at the IDC knowing that their confidence will be respected. Students are not allowed to take notes during lectures in order to reassure speakers as to the security of their utterances. The lectures are generally relevant to the problem under study in syndicates at the time.

There are two tours during the course. At Easter students, in parties of approximately ten, visit a representative cross-section of British industry. These visits are arranged by the Board of Trade and during them students get the opportunity of talking not only with factory workers and managers but also with trades union officials. Parties go to different areas of Britain and see the local industries but a visit down a coal mine is included in each itinerary. The industrial tour lasts a week.

The second is a tour abroad done between the summer and autumn terms in August and September. In 1955 there were five parties

each approximately twelve strong which toured (a) North America, (b) Africa, (c) the Middle East, (d) Southern Europe and (e) Northern Europe. Students were allowed to go to the area of their choice as far as was consistent with keeping balanced and representative parties for each tour. Tours lasted from four to five weeks and as all the long journeys were done by air considerable ground was covered, for example the African tour included Kenya, Uganda, the Gold Coast, Nigeria, the South African Union and the Central African Federation, and the Southern European itinerary was Paris, Frankfurt, Bonn, Munchen-Glabdbach, Dusseldorf, Berlin, Brussels, the Hague, Vienna, Verona, Rome, Naples, Istanbul and Ankara. At each stopping place students were briefed on the local political, economic and military situation by members of the government of the country and by officials of the British Embassy. Within the limits of the time available they were shown such military and industrial installations as possible. The cultural side was not altogether neglected and any spare time was filled up with visits to places of historical or artistic interest. Students received a good deal of entertainment and got an opportunity of talking to politicians, diplomats, soldiers, businessmen and many others. The tours were crowded and strenuous but were of great value in giving a first-hand impression of countries and correcting perspectives formed by study in the lecture room and library. On getting back to the IDC each party, through selected spokesmen, makes a presentation of its tour before the rest of the college, giving the important impressions registered. These tours are an expensive item of the course but there is general agreement that the money spent on them gives a proportionately large return in the benefit students derive. It is essential that countries should have a body of men in the services and among civilian officials with a personal knowledge of conditions abroad; without this, serious miscalculations and errors of judgement are possible.

Interspersed throughout the course a great many visits to demonstrations and to places of widely differing interest are arranged, which serve to break the monotony of lectures. Some of the visits of the 1955 course were to:

A demonstration by the London Fire Brigade.

Atomic Research Establishment, Harwell.

The Agricultural Research Station, Rothamstead.

A demonstration on the aircraft carrier 'Centaur.'

A combined operations demonstration.

A demonstration of aerial bombing in Germany.
A tank and fire-power demonstration in Germany.
A Canberra bomber squadron including a flight on a bombing training mission.
Scotland Yard.
The BBC.
The Stock Exchange
Lloyds

The above list is enough to give an idea of the range of subjects covered. The idea of these visits is to enlarge and bring up to date the general education of students on subjects with a bearing on defence.

The course at the IDC is both interesting and educative. It gives officers and officials, in the prime of their active careers, an opportunity to study defence problems under conditions where they are free from responsibility and have the stimulus of contact with their colleagues from other parts of the globe, who bring to bear on the same problems a different light, the product of their own experience and peculiar circumstances. The course teaches them to understand the point of view of services and departments other than the one to which they belong and to work with them as a team. It brings up to date their knowledge on scientific development and strategic thinking. The value of a course of this type has been recognised by other countries, who have set up equivalent institutions to the IDC of their own. There is the US National War College and the Canadian National Defence College. France, Italy and even Sweden have what amounts to an IDC of their own.

India has no IDC at present but she sends two or three students every year to Seaford House. This is admirable but the number trained each year is very small. This provides little more than a useful window on what is happening in Western strategic thinking. It is a small but valuable contribution to the binding together more closely of the Commonwealth through personal liaison. However, India's policy of keeping out of military alliances and her geographical position in Asia give rise to a totally different sort of defence problem from that studied at the IDC. There is a good case for setting up a National Defence College in India where members of the services, officials from the administrative service, financial service and the Defence Science Organisation could come together to undergo a similar course to that at the IDC but in which Indian Defence problems and the strategic and social aims of the non-aligned

bloc of Asian countries were made the special subject of study. It would enhance the value of this course if officers from abroad, both from the West and from neighbouring countries, were represented and pooled their knowledge and experience with those of the Indian students. In fact without them there would be danger of thinking in the college becoming narrow and parochial.

One of the effects of the development of nuclear weapons is that the next war will start at full tempo instead of, what has happened in the past, beginning with a period of mobilisation behind a defensive front line before a building up to a full commitment of strength. It is all the more important that the machine for the direction of the national war effort be studied and understood by the drivers of that machine before the emergency arrives. A National Defence College would make a big and indispensable contribution towards that understanding.

APPENDIX A

Lectures at the IDC—1955 Course

(*Note*—Lectures are given in chronological order. The headings give the subject of the problem under study at the time, but lectures are not always relevant to this subject.

The Commonwealth

1. The British Constitution and System of Government—Prof K. C. Wheare, CMG, MA.
2. The British Commonwealth—Prof C.E. Carrington, MA.
3. The Colonial Empire—The Rt Hon Alan T. Lennox-Boyd, MP.
4. Present and Future Problems of Australia—HE The Hon Sir Thomas White, KBE, DFC, VD.
5. Present and Future Problems of Canada—HE Mr Norman A. Robertson.
6. Present and Future Problems of New Zealand—HE The Hon. T. Clifton Webb.
7. Present and Future Problems of the Union of South Africa—HE Mr G.P. Jooste.
8. British Africa other than the Union—Mr Kenneth G. Bradley, CMG.
9. Present and Future Problems of India—HE Mrs Vijaya Lakshmi Pandit.

10. Present and Future Problems of Ceylon—Mr P.O. Fernando.
11. Present and Future Problems of Pakistan—HE Mr Mohammed Ikramullah.
12. British Colonies other than African—Sir John Martin, KCMG, CB, CVO, and Mr P. Rogers, CMG.

America and her Position in World Affairs

1. The US Constitution and System of Government—Prof K.C. Wheare, CMG, MA.
2. American Thought and Way of Life—Mr Herbert S. Agar, MA, PhD, LittD, LLD.
3. United States Internal Politics—Prof Asher N. Christensen.
4. Britain and America—Prof D.W. Brogan, MA, LLD.
5. Parliamentary Procedure—The Rt Hon Herbert S. Morrison, CH, MP.
6. The Influence of the Press on Public Opinion and Policy in the USA—Mr Drew Middleton, OBE.
7. The Civil Service—The Rt Hon Sir Edward Bridges, GCB, GCVO, MC.

Economic Survey

1. The Economic Problem—Prof L.C. Robbins, CB, MA, BSc, FBA.
2. International Economic Organisations—Mr M. Stevenson, CMG.
3. Functions of the Board of Trade—Sir Frank Lee, KCB, CMG.
4. British Manpower—Sir Godfrey H. Ince, GCB, KBE.
5. British Industry from the FBI Viewpoint—Sir Norman V. Kipping, JP.
6. British Industry from the TUC Viewpoint—Sir Vincent Tewson, CBE, MC.
7. Internal Transport—Gen Sir Brian H. Robertson, Bt, GCB, GBE, KCMG, KCVO, DSO, MC.
8. Fuel and Power—Sir John Maud, GCB, CBE.
9. British Agriculture—Sir Frank Engledow, CMG, FRS, MA, BSc.
10. British Shipping—Sir Donald F. Anderson.
11. International Commerce—Mr J.L.S. Steel.
12. State of UK Economy in Relation to Defence Requirements—Sir Leslie Rowan, KCB, CVO.
13. United States and World Affairs—HE The Hon Winthrop W. Aldrich, GBE.

USSR, Communism and the Cold War

1. Communism—Prof H.A. Hodges, MA, D. Phil.
2. An Answer to Communism—Mr Isaiah Berlin, CBE, MA.
3. Russia and the Political Background to Soviet Strategy—Mr Paul F. Grey, CMG.
4. Communism in Yugoslavia—Mr F.W.D. Deakin, DSO, MA.
5. Communism in Asia—Mr Max Beloff, D. Litt, MA, FRHist S.
6. The Attitude of British Organised Labour to Communism—Mr Victor Feather.
7. Communism as a Security Problem—Mr R. Thistlethwaite.
8. The Attitude of Christianity—Very Rev E.G. Selwyn, MA, DD.
9. Experiences as a Prisoner of War in North Korea—Captain William N. Preston, USAF.
10. Economic Prospects of the Commonwealth—Commander (S) Jackson, CMG, OBE, RN (Retd).

The United Nations Organisation

1. Britain and UNO—The Rt Hon Anthony Nutting, MP.
2. The Elements of Sea Power—Prof J.G. Bullocke, MA.
3. The Elements of Land Power—Prof N.H. Gibbs, MA, D. Phil.
4. The Elements of Air Power—Air Chief Marshal Sir Guy Garrod, GBE, KCB, MC, DFC, (Retd).
5. The British Educational System—Mr D.F. Vosper, TD, BA, MP.

Europe

1. Germany and the East—Mr J.W. Wheeler-Bennett, CMG, OBE, MA.
2. Germany and the West—The Hon C.D.W. O'Neill, CMG.
3. France—Mr William Pickles.
4. Italy—Sir Victor A.L. Mallett, GCMB, CVO.
5. British Aspects of Allied Strategy—Marshal of the RAF Sir William F. Dickson, GCB, KBE, DSO, AFC.
6. Yugoslavia—Mr E.H. St. G. Moss.

The Middle East

1. The Military Situation in the Middle East—General Sir Charles F. Keightley, GCB, KBE, DSO.
2. Turkey—Mr G.G. Simpson.
3. NATO Affairs—Jonkheer H.F.L.K. van Vredenburg.
4. Greece—The Hon C.M. Woodhouse, DSO, OBE.

5. Spain—Sir John Balfour, GCMG.
6. Trends Towards European Integration—Mr William Clark, MA.
7. The Role of the Army in Modern Warfare—Lieut-Gen Stanley R. Micklesen, US Army.
8. Amphibious Warfare—Maj-Gen C.F. Phillips, CBE, DSO.
9. Political and Social Problems of the Middle East—Prof Bernard Lewis, BA, Ph D, FRHist S.
10. Egypt and the Sudan—Mr T.E. Bromley.
11. Problems of the Arab World and Israel—Mr C.A.E. Shuckburgh, CB, CMG.
12. Problems of Persia and Iraq—Sir John Troutbeck, KCMG.
13. Britain and America in the Middle East—Sir Reader Bullard, KCB, KCMG, CIE.
14. French North Africa—Mr J.H. Huizinga.
15. Problems of French Foreign Policy—Monsieur Maurice Dejean.
16. French Military Problems—General d'Armee Augustin Guillaume

The Far East

1. China—Mr C.T. Crowe.
2. British Trade Interests in China—Mr H.J. Collar.
3. Prospects of Present Day Japan—Dr Francis C. Jones, MBE, D Phil.
4. Viet Nam, Laos and Cambodia—Sir Hubert Graves, KCMG, MC.
5. South East Asia—Mr F.S. Tomlinson, CMG.
6. Malaya—HE Sir Donald C. MacGillivray, KCMG, MBE.
7. American Policy in the Far East—Mr Benjamin Welles.
8. The Military Situation in the Far East—Admiral Sir Charles E. Lambe, KCB, CVO.
9. British Policy in the Far East—Mr W.D. Allen, CB, CMG.

Civil Defence

1. Scientific Aspects of Modern Warfare—Sir Frederick Brundrett, KBE, CBE.
2. Introductory Talk on Atomic Physics—Dr J.V. Dunworth, CBE.
3. Chemical and Biological Warfare—Sir Owen H. Wansbrough-Jones, KBE, CB.
4. The Effects of Atomic Weapons—Dr H.R. Hulme, Ph D, Sc D, BA.

5. The Air Defence of Great Britain—Air Marshal Sir Dermot A. Boyle, KCVO, KBE, CB, AFC.
6. Government Policy for Civil Defence—General Sir Sidney C. Kirkman, GCB, KBE, MC, (Retd).
7. The Future of Military Aviation—Sir Arnold Hall.
8. Electronics and Guided Weapons—Sir Steuart Mitchell.
9. Future Naval Weapons—Captain R.I.A. Sarell, DSO, RN.
10. Future Army Weapons—Lieut-Gen Sir Dudley Ward, KBE, CB, DSO.
11. The Problems of South East Asia—The Rt Hon Malcolm J. Macdonald.
12. Future Air Weapons—Air Vice Marshal L.F. Sinclair, GC, CB, DSO

Major War Exercise

1. Economy of the USSR—Brig G.R. Way, OBE (Retd)
2. Capabilities and Intentions of Russian Land and Air Forces—Brig D.W.B.T. Hogg, MBE and Air Vice Marshal W.L. M. MacDonald, CBE, DFC.
3. Strategic Air Power—Brigadier-General James H. Walsh, US Air Force.
4. Sea Communications in War with Russia—Rear Admiral J.G. T. Inglis, OBE.
5. Defence of Germany—Gen Sir Richard N. Gale, GCB, KBE, DSO, MC, ADC.
6. The Press—Sir Linton Andrews.
7. Peaceful Co-existence—Mr Donald McLachlan, OBE.
8. Problems of the Northern Flank—Gen Sir Robert Manserg, KCB, KBE, MC.
9. Defence of the UK—Mr R.C. Chilver, CB.
10. Organisation of British Intelligence—Mr P.H. Dean, CMG.
11. Command and Control in War—Field Marshal The Viscount Montgomery of Alamein, KG, GCB, DSO.

Future Allied Strategy

1. British Foreign Policy—Sir Harold Caccia, KCMG.
2. Transport in War—Maj-Gen A.T. de Rhe-Philipe, CB, OBE.
3. Problems of the Southern Flank—Admiral William M. Fichteler, USN.

4. Naval Problems—Admiral The Earl Mountbatten of Burma, KG, PC, GCSI, GCIE, GCVO, KCB, DSO.
5. RAF Problems—Marshal of the RAF Sir William Dickson, GCB, KBE, DSO, AFC.
6. Manpower for the Three Services—Mr A.J. Newling, CB, CBE, MVO, TD.
7. Army Problems—Lieut-Gen W.P. Oliver, CBE, OBE.
8. Financial Control in the UK—Mr G.P. Humphries-Davies, CB.
9. Future Strategy—Marshal of the RAF, Sir John C. Slessor, GCB, DSO, MC.
10. Soviet Cold War Methods—Mr P.F. Grey, CMG.
11. British Financial and Economic Policy—Sir Edward C.G. Boyle, MP.
12. Defence Needs and Modern Industry—Sir James Helmore, KCB, KCMG.

The Integration of the Three Services

1. Cabinet Government in Peace and War—The Rt Hon Sir Norman Brook, GCB.
2. Allied Command Problems—Vice-Admiral R.M. Dick, CB, CBE, DSC.
3. Co-ordination of Military and Political Strategy—General The Lord Ismay, PC, GCB, CH, DSO.
4. Military Organisation of NATO—Air Marshal Sir Walter L. Dawson, KCB, CBE, DSO.
5. Political Problems of NATO—Sir Christopher E.S. Steel, KCMG, MVO.

Commonwealth Conference

1. The Commonwealth—The Rt Hon The Earl of Home, PC.
 2. Problems of a Supreme and International Commander—Admiral The Earl Mountbatten of Burma, KG, PC, GCSI, GCIE, GCVO, KCB, DSO.
 3. Defence Problems—The Rt Hon Selwyn Lloyd, MP.
 4. The Attitude of Christianity towards World Problems—The Archbishop of Canterbury.
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BIRTH OF A WEAPON

BRIGADIER L. S. ANAND

THERE is an old saying that necessity is the mother of invention. In the general engineering world, it would perhaps be appropriate to qualify it by saying 'If necessity is the mother of invention, then the design office is its father and the patent office the adviser on birth control'. In Defence technology, the parallelism is further modified as although the parents essentially remain unchanged, the advice on 'family planning' emanates from a variety of complex sources dealt with in some detail in the following paragraphs.

INVENTION

The word 'invention' has often been used vaguely and loosely. At one time it perhaps indicated a genius getting a brain-wave for producing a novel device to carry out a difficult operation simply and effectively, *e.g.* the invention of telephone by Graham Bell. It was not uncommon, however, for any ordinary and even an ignorant person suddenly to strike upon a new idea leading to an invention. Such techniques are however haphazard, uncontrolled and hence unsatisfactory, particularly for Defence requirements. It has often happened that the arrival of the 'brain-wave' and the 'necessity' could not be synchronized. The history of rocket development affords a good example of this. Many brilliant ideas could result in extremely valuable forms of machines, but they were lost in the wilderness, as the necessity for such devices did not exist, or was not appreciated in their true perspective. At other times when the necessity did exist, the brain-wave just refused to appear at the right moment. There is no wonder, therefore, that such a concept of invention is dying out of Defence technology.

A 'Popular' Concept

To quote a hypothetical example, a lay-man may imagine that next time a Hitler is about to declare a world war, he would call his technical kings and say, "I want you to invent a super-weapon to defeat the enemy. I know in the Second World War you invented the V-I (flying bomb) and the V-2 (liquid fuel rocket) and multifarious other 'Vs' that I did not

have the chance to use. But then the British invented the radar in advance to counter-act the flying bomb and the Americans invented the atom bomb and in fact we missed getting a few of them dropped on the Fatherland by only a hair's breadth. The Fuehrer directs that his troops will have a 'master weapon' which the allies may not even dream of. Go and invent it." Such 'pep-talk' may have a stimulating psychological effect, but it has little utility value. In fact, I suggest that some of the German weapons, developed and under development during the latter half of World War II had more spectacular than utility value. The thousand-ton tank and certain rockets like the 'A-10' might sound gigantic but were unlikely to have been the immediate requirement of the Force Commanders. It appears that the Bavarian Corporal imagined himself to be not only a master strategist but also a master technician. In mentioning this, it is far from my intention to belittle the competence of the German designers. In fact, they produced some excellent examples of good design work, *e.g.*, the liquid fuel rocket 'A-4' popularly known as the V-2

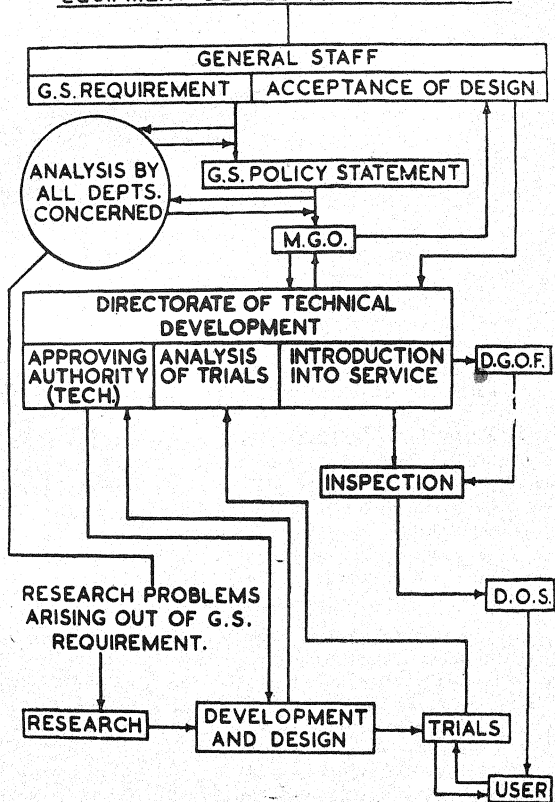
A Practical Concept

In fact, what may happen is that a team of representatives of the General Staff, designers and manufacturers would confer and take stock of the capabilities of existing weapons in the possession of their own troops and of the enemy. The Services would perhaps state that a certain equipment, *e.g.*, the tank, can be beaten by the opposing anti-tank gun. They would therefore require a new tank with stronger armour and yet without extra weight so as not to hamper mobility. At the same time, they would require a gun that will kill not only any of the existing enemy tanks, but also any that is likely to be produced by them in the foreseeable future. A team of experts would then study in minute detail the design and performance data of existing tanks and the anti-tank guns and set to work in a systematic manner for the production of a new tank and a new anti-tank gun to specification indicated by the Services and agreed to by the technical experts. The same procedure would generally apply to bombers and anti-aircraft guns, battleships and submarines, torpedoes and under-water mines; radar and its jamming devices, rockets and their antidotes, and the innumerable other items which complete the list of a Force's Equipment Tables.

EQUIPMENT DEVELOPMENT SEQUENCE

The Chart shows a typical sequence of development of a new equipment for the Army. There are variations from country to country

EQUIPMENT DEVELOPMENT SEQUENCE



or amongst the different Services in the same country, but the pattern remains unaltered.

GS Policy Statement

The requirement is initiated by the user, *i.e.*, a body of troops in the field who find that the implements of war at their disposal do not possess the fire-power, mobility or surprise potentialities essential to defeat the enemy. The user, therefore, demands a new equipment. This requirement is passed on to the General Staff at Army Headquarters. The General Staff consult the various Directorates and departments concerned and mould the requirement into a 'G.S. Policy Statement.' This statement specifies the details of range, accuracy, fire-power, maximum weight etc, for the equipment, which shall we say, is a new infantry anti-tank gun. The General Staff dictate the objective to be achieved, *e.g.*, an anti-tank gun to penetrate 6 in. of armour, firing at an angle of 55° from a range of 300 yards for Infantry Platoons. They may also specify the 'lethality' and the maximum weight of the equipment, say 15 lbs. But they should refrain from putting unnecessary limitations on the solution of the requirement and allow as much latitude to the designer as possible.

Design, Research and Prototype Stage

The General Staff Policy Statement is forwarded through the Technical Development Directorate to a Technical Development Establishment. The designer gets down to work on the drawing board and produces a blue-print of the proposed solution. If a design problem has to be fed with information requiring basic research, a research project is initiated by the Defence Science Organization under the control of the Scientific Adviser to the Ministry of Defence.

The next stage is that of manufacture of the prototype which converts the idea on the drawing board into a model in hardware. The terminology used for some of these models may be of interest. For instance, there is the 'rig' which is a working arrangement merely intended to illustrate a principle. The next one is the 'mock-up' which is a non-working scale model to indicate the general layout. Thirdly there is the 'pilot model' which is a full-scale model to proof components and techniques. Fourthly there is the 'proto-type' which is the final model for user-trials and from which production drawings are eventually sealed. At a later stage there is the 'pre-production model', which refers to a relatively small quantity made from the production drawings ahead of the main run, to

test production conditions. Lastly there is the 'first-off' which is the first equipment produced from a main production contract.

Trials

The prototype undergoes technical trials, *i.e.*, it is tried out by the Technical Staff to test whether it meets the requirement. These trials are analysed at various levels and if satisfactory the prototype is sent for user trials. In the case of an infantry anti-tank gun the user trials will be carried out perhaps by the Infantry School and/or an active battalion, specially selected for the purpose. The user comments upon the equipment from his point of view. For instance, he may remark that the new weapon is too complicated, from the operational or maintenance aspect, or it is too cumbersome for transportation. Such users' comments and those of the General Staff are reconsidered by the designer, and through a long and extensive procedure of mutual consultation, the designer eventually produces the final answer. Action is then taken to 'seal' the drawings. The sealed drawings are kept in the custody of the Authority Holdings Sealed Particulars (AHSP) and they govern all future manufacture of the particular equipment.

Mass Production

Once all the teething troubles have been overcome, an order is placed for a large quantity with a view to equip the Army or certain selected units on a pre-determined scale of issue. The production of warlike stores in this country is principally the function of Ordnance Factories administered by the Directorate General of Ordnance Factories under the Ministry of Defence. It is not my intention to discuss here the merits and demerits of concentrating the production of warlike equipment in State-owned factories. However, it will be wrong to imagine that the Ordnance Factories by themselves are capable of undertaking production of all Defence requirements, particularly in times of emergency. The Private Sector must, therefore, share a proportionate load of the Defence commitment in peace, if they are to act as successful partners for production in war.

Inspection

Inspection of the output of Ordnance Factories for Army requirements is carried out by Technical Development Establishments, which come under the Directorate of Technical Development, MGO Branch, at Army Headquarters. These are, as a rule, mixed establishments consisting of Service Officers and civilian staff. The Navy and Air Force have also

resorted to indigenous production as far as possible, and have set up corresponding inspection organizations.

When the manufactured stores are put up for inspection the inspector does one of three things:—

- (a) accepts the stores to drawing and specification,
- (b) sends back to the producer for rectification those stores which are likely to come up to specification after repairs,
- (c) rejects the rest.

The importance of the inspector's role can be well appreciated as he is the deciding authority to say whether or not the manufactured equipment is good enough for issue to the troops. If he is even slightly careless, 'dud' equipment may find its way to the front-line. If he is over-cautious or guided by the 'letter of the law' rather than common-sense, he might starve the troops of weapons which would be perfectly serviceable even if they do not conform to specification word by word. Upon his discretion may rest the lives of the troops and victory or defeat in a battle.

Storage and Issue

The accepted output of the factories is sent to Ordnance Depots which store and look after the equipment until it is required for issue to troops under the orders of the General Staff.

ECONOMIC ASPECT

Just as no country can keep a large standing army in peace, similarly no country can afford to keep its armament production going at a war pitch in peace time. It is, however, essential that a permanent nucleus of this industry is maintained in peace. If we neglect the Armament industry in peace, we might find ourselves in the position of a man who starts digging a well after his house has caught fire.

Often it is advisable to employ the war machinery on civilian work requiring similar type of skill. It provides a continuity of livelihood to the skilled worker who cannot be trained overnight when the emergency arises. It may be interesting to know that a factory producing large-size barrels for guns can, with advantage, be used for producing tubes for oil-wells in peace. Although every effort should be made to run this industry on an economic basis, it cannot be expected to compete with com-

mercial concerns. The expenditure may be treated as the partial cost of preparedness or as a part premium on a National Security Insurance Policy.

The design and development establishments may also contribute to economy in their own way. For instance, let us consider again the Infantry anti-tank gun in view of the eternal battle between the armour and gun. The Army demands a better weapon and if the designer produces such a weapon, it may not be wise to go into mass production unless there is an imminent emergency. A more economical course might be to work out the new design, manufacture a few weapons and carry out extensive trials. When the design is finalised, we may go as far as making jigs and tools for going into production at short notice. The designer can then proceed with a further study and it must be appreciated that development is a non-stop process. There will always be a cheaper and better method of doing things. By following this procedure, we shall ensure that we have the latest instruments of war ready to go into production in case of an emergency without being in the unfortunate position of having the Ordnance Depots dumped with piles of out-of-date equipment.

A COMMENT ON THE ORGANIZATIONAL ASPECT

It is clear from the foregoing that the successful production of a new weapon can only come from the combined efforts of the user, the General Staff, the designer, the research establishment, the manufacturer, the trial establishment and the inspector. A weakness on the part of any one member of this team would adversely affect the efficiency of the whole team.

Present Set-up

At present the user and General Staff aspects are under the control of the Chief of the General Staff. The design, development and inspection activities are the responsibility of the Directorate of Technical Development and the Technical Development Establishments. The research projects are sponsored by the Defence Science Organization under the control of the Scientific Adviser to the Ministry of Defence. The manufacturing commitment is that of the Ordnance Factories under the Director General of Ordnance Factories. In such a set-up, co-ordination of effort must be difficult with the best of intentions. It is apparent that the present organization is by no means perfect. It will be a great

advantage if all the above activities were controlled and co-ordinated by a central authority, ultimately responsible for the efficiency and output of Defence production.

The UK Pattern

In the UK the Army and Air Force production requirements are controlled by the Minister of Supply, who ranks as equivalent to the Minister of Defence in the Cabinet Defence Committee. The Supply Council consists of the Minister, Parliamentary and Permanent Secretaries, Controllers of Supplies (Munition and Air), Controllers of Atomic Energy and Guided Weapons, the Chief Scientist and representatives of the Admiralty, Army Council and Air Council. This high-powered board controls all the design development, research, manufacture, trials and inspection activities. In brief, the War Office states the requirements and the Ministry of Supply delivers the goods.

The 'New Look' in India

To overcome some of the shortcomings of the present set-up, the Government of India have recently announced the institution of the Defence Production Board under the Chairmanship of the Minister of Defence Organization. The executive control will be in the hands of the Controller General of Defence Production, who will also be the ex-officio Deputy Chairman. In addition, the membership will consist of the representatives of the Army, Navy and Air Force, the Director General of Ordnance Factories, the Scientific Adviser to the Ministry of Defence and a representative of the Ministry of Finance. This highpowered board, the counterpart of the Supply Council in UK, will be given semi-autonomous powers by the Government so as to cut out 'red tape' as far as possible. This is undoubtedly a step in the right direction. But the following two observations may not be out of place. Firstly, it is important to realize that besides the perfection of organization charts on paper, in any "committee controlled" system, there must be perfect team work and the determination to work the system amongst the members of the team in order to produce results. Secondly, controllers and directors may be important for guidance but the bulk of 'field work' as distinct from 'chair work' has to be done by much humbler people. Unless an efficient and capable body of technical workers on a considerable scale is built up at that level, execution of ambitious plans will not materialize. The latter, to my way of thinking, is our most important shortcoming.

CONCLUSION

The preceding paragraphs clearly show that the mechanics of the birth of a new weapon are complicated and long drawn out. If anything, the procedure indicated over-simplifies its complexity. In practice, from the date of 'conception' of the requirement to the actual 'birth', it takes many years of hard work and anxious moments in addition to heavy financial burden to produce a new weapon. That is at least one good reason why the current weapons cannot be thrown away lightheartedly in exchange for new unproved 'gadgets'.

The set-up of the Defence Production Board as recently announced is certainly a step in the right direction. But it is vital to build up a body of designers and technicians at a much lower level who alone can execute the plans made by this Board.

SPACE TRAVEL

MAJOR E. A. VAS

SINCE the very earliest of times, man has dreamt of travel from planet to planet. Imaginative authors before Jules Verne have written hair raising stories of the possibilities of such travel and described the machines in which explorers would set out from the Earth on their journey through space. A more modern author of scientific fiction was H.G. Wells, who described the adventures of interplanetary travel in a series of imaginative works, one of which even described a war between a united Earth and invaders from space;¹ but this was all fiction.

The application of the rocket motor for high speed travel and the large-scale research in guided missiles, now being conducted by the Western nations, have given rise to a fresh spate of rumours on space travel. In this article certain problems of space travel will be discussed in simple non-technical language, in order to clear up doubts on fundamental issues and assist those who are interested in the progress being made in this sphere to weigh up, for themselves, the credibility of the ever increasing news reports that appear in the world press from time to time. After considering the general problems that arise while attempting to escape from the Earth's gravity, we will go on to rockets and man-made satellites, and some of the difficulties that must be overcome by the scientists and engineers who are designing the space ships of the future, ending up with the military and non-military significance of these experiments in space travel.

GENERAL PROBLEMS ARISING FROM THE EARTH'S GRAVITY

The Effects of Gravity

Gravity is that force which acts on all bodies in the same manner and is almost constant all over the Earth. The effects of this force are well known to all of us. Gravity prevents us rising off the ground and causes us to fall back to Earth unless held up in the air by some force capable of overcoming its pull. The aeroplane is one such man-made device, capable of exerting a force strong enough to overcome the pull of gravity and thereby propelling itself into the atmosphere.

1. *War of the Worlds*, H. G. Wells

27.3 DAY ORBIT
2304 MPH

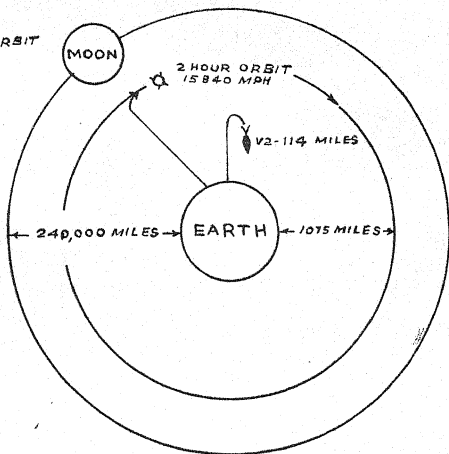


FIGURE 1

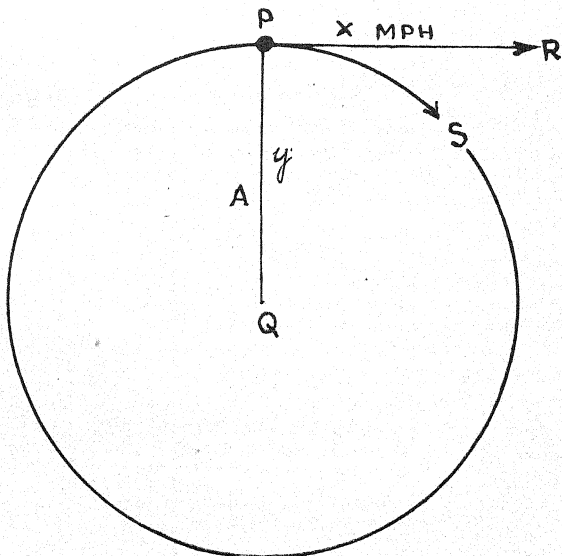


Figure I shows the highest flights yet reached by man-made machines. The V2 Rockets are reported to have reached up to heights of 114 miles before running out of fuel and crashing back to Earth. A more recent development of rocket is also said to have reached a height of 250 miles before returning to the Earth². Before discussing the question of preventing such rockets falling back to the Earth, when their fuel is consumed, let us again look at Figure I and ask ourselves, "Why does the Moon not fall down to the Earth?"

Free Orbits

It will not be possible to answer this question without going into a few simple scientific explanations. It is, however, essential that this fundamental phenomenon be understood, as it plays an important role in the plan to conquer space.

Figure 2 illustrates a simplified model of the problem. If object P is attached to point Q by an elastic band A, and if P is given a constant speed of x mph in the direction R; then P will continue circling around Q at a constant speed and at a constant distance away from Q, along path (orbit) S. As long as this is happening, elastic band A will exert a pull, shown as y , on object P. The speed and orbit of P will remain the same, so long as x and y remain constant. If the elastic band snapped, object P would fly off at a tangent. On the other hand, if speed x was not fast enough, object P would not circle round Q; again, if speed x was too fast, P would snap A and fly off at a tangent. In short, there must be a balance between speed x and pull y for P to circle around Q.

Now imagine P is the Moon and Q the Earth. The force y is the gravitational pull exerted by the Earth. This pull is constant and acts as an invisible elastic band. As the Moon has a constant speed of 2,304 mph in the direction R, it circles around the Earth, (See Figure 1), taking 27.3 days to complete its orbit, travelling at 2,304 mph at a distance of 240,000 miles from the Earth.³ The point to remember is that the Moon is in fact a prisoner in the Earth's gravitational field, as surely as the object P was secured to point Q in Figure 2.

In figure I, will be seen yet another imaginary orbit drawn 1,075 miles away from the Earth. A Satellite in this orbit would circle endlessly

2. *Time* Pacific Edition 8 Dec 52

3. Readers interested in a more detailed but simple explanation may read *Science for the Citizen*, Lancelot Hogben, pp 295 to 308.

around the Earth at 15,840 mph and would take 2 hrs to complete its orbit. Theoretically there is no limit to the number of such possible orbits; there is however a point reached beyond which the Earth no longer exerts any gravitational pull and beyond which an object would sail off into space at its acquired speed and is said to have "escaped" from the Earth's gravity.

A study of the Moon's orbit and the imaginary orbit in Figure I brings out the fact that the further away the orbit is from the Earth, the slower the speed of the Satellite and therefore the longer the time taken to complete the orbit. This relationship between speed and distance is fixed. To go slower than the required speed would mean to crash down to the Earth; to go faster would mean to escape into space.

Nearest Orbit

In the previous paragraphs it was stated that theoretically there was no limit to the number of free orbits which could exist between the Earth and the last possible orbit outside the Earth's gravitational field. There is, however, a point, nearer than which no free orbit could exist. This is a point approximately 200 miles away from the Earth just outside the atmosphere. Any object attempting to revolve round the Earth at less than 200 miles would be burnt by friction with the atmosphere. The many shooting stars we see are examples of this.

It has been calculated that a Satellite moving in the nearest possible free orbit, 200 miles away from the Earth, would travel at 18,000 mph, taking an hour and half around the Earth. Note again, how the nearer the orbit, the faster the speed of the Satellite.

It is also important to note that all Satellites beyond 200 miles away require only an initial speed to be given to them: as there is no air resistance, they will continue to move at their initial speed unless obstructed by some extraneous force.⁴

II

ROCKETS AND MAN-MADE SATELLITES

Rockets

The reader is aware of the limitations of the conventional aircraft. These are the limitations of fuel, speed and the need for air in order that the principles of aerodynamics may be fulfilled. The work of German

4. Newton's First Law of Motion

scientists and engineers, during World War II, produced the V2 Rocket. The principal characteristic of the rocket is that it will work best in the absence of air, because a rocket does not rely on air for its "push".⁵ The only effect of the atmosphere around a rocket is to reduce its efficiency.

Without going into the technical details of the various means at present employed to boost the speed of rockets by stages, it is of interest to assess the performance of the present-day rocket. Arthur C Clarke, Chairman, British Interplanetary Society, says that it is "impracticable to build rockets that would travel at more than twice their exhaust speed, because of the amount of fuel required. This sets a speed limit—if present day fuels are employed—in the region of 10,000 mph."⁶

The reader will note the emphasis on the words "present-day fuel"; the advent of atomic power as a propellant may well provide us with higher speeds than 10,000 mph. However, it is of interest to know how present-day experiments are attempting to utilise these high speeds for space travel.

Artificial Satellites

If a rocket (Figure I) were to travel at 15,840 mph and after travelling 1,075 miles away from the Earth, were to turn as shown, it would enter a free orbit. As long as the Earth continued to exert a constant pull and the rocket continued to travel at a constant speed of 15,840 mph, the rocket would circle endlessly around the Earth in a free orbit. If the rocket motors were now switched off, the rocket would continue to travel at its initial speed of 15,840 mph in a frictionless space. The rocket will now have become an artificial satellite with a two hour orbit. Human beings are born in a world of friction (in the scientific sense!) and it therefore becomes psychologically difficult to imagine space in which there is no friction and where bodies, once moved by an extraneous force, will continue to move at an unaltered speed until once again "forced" to change either direction or speed.

In order to move an artificial Satellite out of its orbit, all that would be required is that the rocket motors be switched on again. Modern science is busy today collecting data and planning for the construction of a rocket that can travel at 15,000 mph. Notice how the nearest orbit is not the best orbit for practical experiment. A near orbit would require speeds of 18,000 mph which are today beyond the reach of modern science.

5. *Guns Shells and Rockets*, J.C.S. Hymans, Chapter Five.

6. *The Exploration of Space*, Clarke, Page 34.

15,000 mph is a more practical proposition. Again, an orbit near the Moon, although only requiring speeds of 1,000 mph, is too far away to consider as a one-stage journey. A distance of 1,000 miles from the Earth and speeds of 15,000 mph are the best choice for an orbit where both speed and distance have to be balanced and a practical compromise effected.

Present research aims at planning for the following sequence of events : send a rocket about 1,075 miles high and when it is at this height—it will be followed by radar and telescopes—to turn it in flight by radio control into an orbit and switch off its rocket motors. The rocket will now have become an artificial Satellite. Once having established an artificial Satellite, the next plan will be to dump fuel on this Satellite and use it as a refuelling station for staged journeys into outer space, firstly to the Moon and thereafter beyond the other planets. The journey from a Satellite onwards will be easier as the Earth's gravitational pull will be less at this point and so relatively less powerful rocket motors will be required for this stage of the journey.

The reader may say here "Refuel at 15,840 mph? What nonsense!" The question of refuelling at high speeds is a matter of relativity. The Earth itself travels around the Sun at 66,000 mph in a 365 day orbit; yet we experience no discomfort when refuelling our cars at a petrol pump. This high speed does not make itself felt by us in our everyday work because we are also travelling at 66,000 mph, and relative to the Earth we are not moving at all. Two Satellites, side by side, in a two hour orbit, even though both travelling at 15,840 mph would in relation to each other be standing still.

These theories are still outside the scope of practical realisation today. The scientific world, although agreed that an artificial satellite can be set up in our generation, are also agreed that it will be some time before manned space ships set out on a trip to the Moon. The first step seems to be the setting up of Satellite stations in suitable orbits. These Satellites would not be manned and would contain scientific instruments capable of sending back to Earth, such data as are necessary to plan for the next stage of space travel.

Once again Professor Arthur C Clarke advises caution in attempting to prophesy a quick trip to the Moon. He visualises the conquest of space taking several slow stages; the first four of which are of interest to us.

He describes these as follows:-

- “(i) Unmanned, instrument carrying missiles will enter stable orbits round the Earth.
- (ii) Manned, single step rockets will ascend to heights of several hundred miles, landing by wings or parachute.
- (iii) Multi-stage, manned rockets will enter circular orbits just outside the atmosphere and, after a number of revolutions, will return by rocket-braking and air resistance.
- (iv) Experiments will be made to refuel these ships in free orbit, so that they can break away from the Earth, make a reconnaissance of the Moon and return to the Earth.”⁷

III

PROBLEMS THAT FACE THE SPACE TRAVELLER

It has already been pointed out that before manned rockets set out from the Earth, considerably more data than are at present available will be required. Numerous problems face the engineer and scientist in the construction of his manned and unmanned rocket. Here some of the less technical difficulties will be discussed. An appreciation of these problems and what is being done to solve them will enable the reader to assess news reports of likely space travellers of the future more judiciously. It is not intended to suggest that the problems outlined are by any means the only ones. There are the problems of Communication, Navigation, Steering and so forth, which are not discussed, as these are considered too specialised for the general reader.

Fuel

From present-day standards of construction and design, it has been calculated that 150 tons of rocket and fuel will be required to carry 110 pounds of payload up to an orbit close to the Earth. To increase the payload will result in a disproportionate increase in rocket and fuel weight which makes any such increase impracticable. To think of a rocket which carries enough fuel to reach, say the Moon, and back in one trip becomes fantastic. That is why scientists have approached the problem of space travel by stages and why the setting up of an artificial Satellite is so important to space travel itself.

7. *Ibid* Page 61.

Landing a Rocket

Another problem that is today facing those who experiment with rockets is the recovery of instruments and their valuable recorded data—when rockets return to the Earth. One answer is to design cheap instruments—these must also be light in weight—that can transmit their readings while in flight and thereby eliminate the need to recover them on return. Another answer is to use a system of parachutes for the descent. The high speed involved seems to indicate that this system is not entirely satisfactory. Yet another solution offered, is to provide rockets with folding wings that are made to sprout by radio control during the descent, and then to bring in the rocket using the Earth's atmosphere as an air-brake. In this system, a rocket is not brought back to the Earth by the shortest route (as present-day V2 Rockets which fall back to the ground when their fuel is consumed) but is made to glide around the Earth, gradually drawing closer and closer to the ground after circling the Earth several times. The advantage here is that the Earth's atmosphere while acting as a brake on the high speed rocket during its return glide, also reduces the dangers of high temperatures caused by air friction at high speeds.

Water, Food and Oxygen

Every manned rocket will have to carry adequate stocks of water, food and air to last for its journey through an atmosphereless space. Once again, the storage of these items will increase the payload to figures which become quite impracticable. Experiments are however being conducted in the technique of soilless farming. Hydroponic farms may have to be set up in space ships undertaking long journeys or on Satellite stations in free orbits around the Earth. These farms would serve a double purpose; firstly to purify the Carbon Monoxide produced by the crew whilst breathing, which is a natural process in green leaves in sunshine: secondly, to provide the crew with a vegetable diet.

Psychological and Physiological

Although live monkeys and mice have been sent up in rocket experiments in the USA, and have returned to the Earth without any apparent ill effects, there is no certainty that the decrease in (and eventual absence of) gravity will have no ill effects on human beings. Scientists are unable to simulate conditions of "less gravity" on the Earth and are therefore unable to experiment except by studying the behaviour of animals sent up in V2 rockets. Apart from studying the physiological ill

effects of such a trip, there is the factor of human psychology. A recent film⁸ depicted a journey to the Moon, wherein the crew of the space ship undergo strange and fantastic experiences. The reactions shown in this film were not unscientific and it is felt that future space travellers will face their biggest hurdle while being mentally readjusted to the strange new emotions of space travel. Some of these may appear to be most disconcerting. It is however worth remembering that Christopher Columbus and his crew were no less disconcerted while attempting to prove, practically, that the world is round.

IV

MILITARY AND NON-MILITARY SIGNIFICANCE OF A SATELLITE

In Part II, it was suggested that the first step in space travel would be the establishing of artificial satellites in a close orbit around the Earth. Data for this project are already being collected by means of V2 Rockets and guided missiles. There are indications that such satellites may be established in the near future, and from what has been said before they are the first pre-requisite to any further progress in space travel. Apart from this advantage it is of interest to consider what will be the military and non-military significance of an artificial satellite.

Non Military

Radio and Television

The curve of the Earth at present restricts the range of radio and television transmitters no matter how powerful these are made. The establishment of a relay transmitter satellite in the sky will enable a continuous relay of interference-free transmission to every part of the world. Experts claim that using the present power of television stations, the whole world could be served with television with a satellite as a relay station.

Astronomy and Navigation

A Satellite station would be moving round the Earth in a cloudless sky since there will be no atmosphere in its orbit. An observatory established in such a region would afford perfect visibility conditions. This will enable astronomers to study the distant planets and stars under the best possible conditions—short of visiting them. The artificial satellite could also be used by navigators for direct observation—as the stars and Sun are used today. Then again, such a station can be an aid to radio navigation.

Meteorology

An artificial satellite, either manned or fitted with a television transmitter, could, at a glance, tell Earth-bound Meteorological stations exactly where storm centres were forming and moving. From such a station one would have a complete picture of the world turning below it.

Military

Von Braun⁹ paints an interesting picture of one such station and the military uses it can be put to. He says, "Such a station would dominate the world. Every two hours it would circle the Earth, and as the Earth turns below it, every part of its surface would come into view. A 100 inch telescope, parked in space and manipulated by remote controls, could distinguish objects on the Earth only 16 inches apart¹⁰."

The same scientist goes on to emphasise this point of superior observation by explaining how troop movements, army, navy and air would be visible both at the bases and the front! and even the changing of unit quarter guards. Under these circumstances, continues Von Braun, Atom-armed bombs could be launched from such stations and controlled in their downward flight.

There are other critics who say that a space station is a vulnerable target and not worth the effort involved in setting it up for military uses. They urge that present research should follow the line of guided missiles and remind the protagonists of Satellite-station warfare that the Germans themselves today criticise Von Braun, as the man who "lost the war for Hitler. His V2 was a great engineering achievement but it had no material effect and drained German brains and material from more practical weapons."¹¹

CONCLUSION

Theoretically there is no limit to the number of free orbits which can exist between the Earth's atmosphere and the point beyond which the Earth exerts no gravitational pull. The further away an orbit is from the Earth, the slower the speed of the satellite and the longer the time taken to complete its orbit. The nearest possible orbit is approximately 200 miles away from the Earth, outside the atmosphere, in frictionless space. There would be no need for any extraneous force to be applied once the

9. World War II German V2 Rocket Expert, at present working at the Guided Missile Centre, Redstone Arsenal, USA.

10. *Time*, Pacific Edition, 8 Dec. 1952.

11. *Ibid.*

centrifugal force of the Satellite exactly balances the gravitational pull of the Earth. The Satellite would be a prisoner in the Earth's gravitational field and would continue circling endlessly around the Earth at the original speed given to it by its rocket motors. It could escape again if its motors were once again switched on. Very high speeds of approximately 15,000 mph are involved in these projects.

The present-day rocket is very nearly capable of the speeds and heights required to enter the nearer of these orbits. The major difficulties that are still to be overcome can be classified under the headings of Fuel, Landing, Water, Oxygen and Physiological and Psychological ill effects of space travel. Until these practical difficulties are overcome, research teams are busy collecting data through V2 Rockets and guided missiles filled with recording instruments.

An incentive to these experiments is the immense scientific advantages that would accrue once a Satellite station was established in space. The advantages to Astronomy, Navigation, Meteorology, Radio and Television are readily appreciated. The detailed observation of the Earth which will be provided by an artificial Satellite is of great military significance. The protagonists of Satellite warfare claim that the first country to establish a Satellite will dominate the world. Their critics, however, urge caution and suggest that the scientific, monetary and industrial effort involved in such a project will not be worth the effort; they advise that research in this field continue along the present lines to improve the V2 Rocket and guided missile technique of warfare.

On 29 July 1955, it was officially announced in Washington, that the United States would launch small unmanned Satellites into space some time between July 1957 and December 1958. It was explained that the satellites would be about the size of footballs; that they would be launched into the upper atmosphere by rocket and encircle the earth at a height of 200 to 300 miles, once every 90 minutes at a speed of 18,000 mph (five miles a second). American scientists said "that the satellites would remain in space for about 15 to 30 days at an altitude of 200 miles and for about a year at 300 miles. These would be visible to the naked eye at Sunrise and Sunset"¹²

These American announcements have resulted in an increasing number of newspaper and magazine reports on space travel.

MOTOR-CYCLE TRIP TO EUROPE

LIEUT. G. D. SHARMA

OFTEN we are asked how we thought of undertaking such a trip or how it came to be that two of us, Lieut. Paul and myself, got together to plan and accomplish it. It could be performed on a ship, train or a plane but without the thrill of working it out one's own way and facing varying situations. Then everything is set and arranged by someone else and you are just a passenger bound by the route, halts and the timings of the transport agency. We therefore decided to work it out ourselves the rough way. The mere thought of spending 5 months' leave visiting foreign countries all by ourselves with no set routine or programme was itself enchanting, apart from the satisfaction it was to give by way of seeing the ancient and modern wonders of the world.

Individually we were thinking on these lines long before we met each other in J. & K. when I was posted to Paul's Unit in August 1954. Some inspiration was drawn from the "Geneva-Bombay Car Rally" which was organised by the 'Alliance International de Tourism' Geneva that October. The leader of the rally Mr. Munch, whom we met at Delhi, encouraged us and gave us some valuable advice. By November the idea had taken deep root and we had put in our applications to Army Headquarters for sanction to proceed abroad on leave.

The planning and preparation for a trip of this nature is more bothersome and takes a lot more time than the trip itself. There is scanty information available to guide an intending tourist. A lot has to be left to chance or judgement of the moment. The finances, leave, sanction from the Army authorities, passport, visas and so many other details have got to be co-ordinated so that the trip materialises on due date. So also promotion examinations, marriages or other family affairs are to be kept in view to avoid any last minute hitch. We were rather fortunate that both of us were equally keen and prepared to brush aside anything that was to come in our way.

We had to obtain the following in addition to the sanction from the Army:

- (a) Passport and Visas

- (b) Tryptyque or Carnet
- (c) International Registration and Number Plate
- (d) International Driving License
- (e) International Health Certificate
- (f) Export Trade Controller's Permit for M/C.
- (g) Reserve Bank of India's sanction for foreign exchange.

Out of these Tryptyque, which is a sort of passport for motor vehicles, can only be had after depositing a cash security to the extent of the value of the car or motor-cycle with the Automobile Association who issues it. We learnt of this rather late, which resulted in a last minute rush to procure Rs. 2,000/- as security. This was not a small sum especially when the resources available had already been tapped to the maximum. If the army authorities take up this matter it may be that in future the automobile association will issue the documents without security from service officers.

Paul was posted out in December and we were separated by a distance of 2,000 miles. Our joint planning received a set-back due to this. We were under regular correspondence but any replies to queries asked by either of us used to take not less than a fortnight. To overcome this we divided our spheres of responsibilities and each of us was free to act on his own. Paul was in a peace station and so he undertook the purchase and modification of a motor-cycle and collection of documents related to it. I had for me the procurement of passport, visas, exchange, export permit and other details which could better be settled during short visits to Delhi.

After receiving our passports from the Regional Passport Officer we applied for the Pakistan visa through the A.G.'s Branch of Army Headquarters. This visa took some time.

In early March a motor-cycle was bought answering the following description :—

BSA twin 500 C.C. 1946 Model, already done 30,000 miles, sans rear suspension, sans stand, teledraulic forks partially effective, and giving over 70 miles to a gallon.

The last factor was a definite advantage as it had a direct bearing on our purse while the rest increased the adventure part of the trip. It was a good machine for its price and being safely back now we have nothing but praise for the old relic which remained our dependable third companion throughout. It hardly gave us cause for serious complaint

during its 13,000 miles association with us, apart from the usual punctures and repeated tightening of the nuts and bolts which were always eager to part company with us. Even BSA Ltd., Birmingham, were astonished at the performance of our machine and as a compliment renovated and brought it to a better shape than it was before we started on our trip from Delhi.

At the end of April we decided to get together at Delhi to make final arrangements and be ready to start. We got our combined leave sanctioned and reached Delhi. The motor-cycle was thoroughly checked and all parts found unfit to undergo 10,000 miles were either repaired or replaced. A special cradle was fitted on the sides to hold our luggage and extra fittings for the spare petrol and oil can behind the pillion. There was not much choice by way of luggage as the space was very limited and we had to be content with the barest essentials. It is surprising how much these barest essentials add up to for such a journey. After repeated conferences and discarding parades in which the utility of each and every item was discussed and thrashed out, we had about 120 lb. to be made into 4 packages and tied all over the motor-cycle. These included a small cooking set, a 2-man tent, blankets, camera, thermos, motor-cycle tools, spares and repair equipment, some tinned provisions and our personal clothing and accessories. By way of money we had sterling travellers' cheques issued by our bankers, Lloyds Bank Ltd., New Delhi. They had also made arrangements to send our salary to any country we liked provided total payments did not exceed the basic travel quota of £600/- per head. Actually we required much less than the basic quota even after taking into account the purchases during the whole tour.

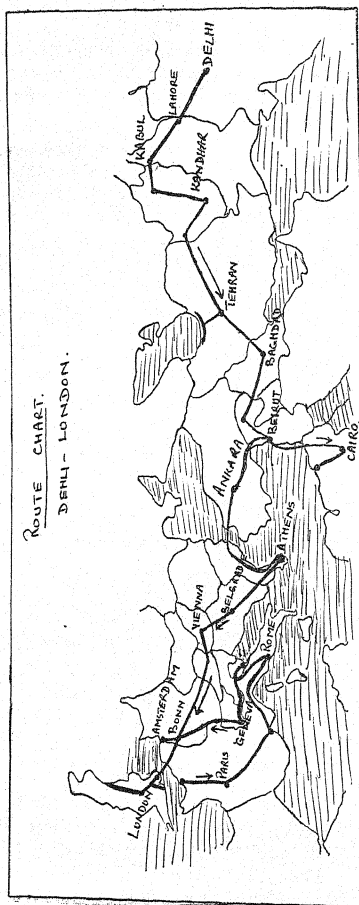
We were required to take transit visas for all the countries en route. In Delhi we obtained visas up to Iraq and left the rest to be taken from the embassies en route as we got along.

Then on 4 May 1955 we set off from India Gate, Delhi, dressed in leather Jerkins, corduroy trousers, looking every inch tourists on an overloaded motor-cycle. We were full of eager expectation and excitement.

THE ROUTE

We were to pass through the following major cities with a few days' halt at every place to get badly needed rest and also for sight-seeing :—

Lahore, Peshawar, Kabul, Kandahar, Tehran, Baghdad, Damascus, Amman, Cairo, Beirut, Ankara, Istanbul, Athens, Belgrade, Venice, Rome, Geneva, Paris, Bonn, Brussels and London.



We were to ride over some of the best and some of the worst roads in the world. While on the one hand we were struggling under 10 miles an hour on the atrocious roads in Afghanistan, we were gliding at sixty on the grand Autobahns of Germany and Autostrada of Italy. If for hours no soul could be seen on the roads in the Middle East there was never a dull moment, day or night, on the European roads.

On the very first day we reached Amritsar before dark, a distance of 280 miles which was good going. Next day after getting some Pakistan Exchange at Amritsar, we reached the Atari border and went through the customs for the first time. This was to be repeated more than fifty times at various borders throughout our trip. The same routine of showing the passports, getting them stamped, declaring the personal effects and money, showing the tryptique, etc. We crossed the barrier and entered Pakistan territory.

We remained in Pakistan for about 4 days and visited Lahore, Rawalpindi and Peshawar. People throughout warmly welcomed us and tried to make our stay comfortable. The day we started from Lahore it started raining heavily. We continued in the rain for about three hours and were completely wet in spite of our rain-coats. Forty miles short of Pindi when I was taking a turn the motor-cycle skidded and we were on the ground before realising what had happened. Fortunately we escaped unhurt and only our camera was damaged slightly. We started off again after hammering the handle bar into position but that was not the end. About 5 miles further on there was a puncture in the rear wheel caused by a horse-shoe nail. This was the first in a series which was to follow throughout the Middle East and occasionally even up to Austria. Now came the practical test of the tools we were carrying in which some of them failed miserably. The tyre levers which were the size of table spoons refused to do their job and started bending the way pressure was applied. The tube was changed somehow—thanks to Paul's deft handling of the large screw-driver. Then came the question of inflating the wheel. The pump we had, meant to be for motor-cycles, was found fit only for inflating balloons. I had to walk back about half a mile to a cycle repair shop to get the wheel inflated. Meanwhile Paul took time off to write home about the beginning of our adventure. After fitting the wheel and the cradle we retied the luggage and were off again after a delay of about 3 hours. Subsequently we were to become experts in puncture repairs clocking at times less than an hour for the whole procedure. Needless to say that at

the first opportunity we got after our initial experience we bought a new set of tyre levers and pump—this time both good enough for a 3 ton lorry.

Nothing untoward happened inside Pakistan after that and we had smooth sailing across the Khyber up to Torkhoum, the Pak-Afghan border. Those days the frontier was practically frozen and there was no traffic between the two countries because of the flag incident. Being Indian nationals we did not have any difficulty in getting across. No sooner had we crossed the barrier and entered Afghanistan than the metalled road disappeared and we found ourselves in a dry river bed full of pebbles and sand. We were expecting bad roads all right, but we were surprised when there was hardly any road good or bad worth the name. It took us about 6 hours to reach Jalalabad, a distance of less than forty miles. Roads throughout Afghanistan are in bad shape, with rough bumpy surfaces except for about a mile long stretch of metalled road in Kabul. We had to ford two major rivers by pushing the motor-cycle in waist-deep water. The remnants of what were once bridges over them are still existent but no efforts have been made to repair them. Even the arrangement for ferrying across light vehicles is not there. The Afghanistan trip had a seasoning effect on us and we emerged fairly weather-beaten, which was of great help in undergoing further hardships. We could have taken a direct route from Pakistan to Iran via Quetta and Zahedan and thus avoided all this inconvenience, but Afghanistan being an interesting and friendly country we did not like to miss it.

Iran is slightly better than Afghanistan so far as roads are concerned although these are also bad enough. One afternoon finding a comparatively better stretch of road, Paul was merrily speeding along in top gear. All of a sudden when about to change into lower gear on a climb he found the gear lever missing from its place. It had fallen off somewhere on the way. I walked back about three miles but could not locate the infernal thing anywhere. We were as badly stuck up now as one would be by losing the keys of a safe. We tried the only other alternative of putting the machine permanently in the lowest gear with the help of pliers but that also did not take us far. Now we spread our blankets on the roadside and began a long wait for some vehicle to come that way in which our motor-cycle could be lifted. Late in the night a 10 ton lorry picked us up and we managed to reach the nearest town. As a spare gear lever was not available even there we had to get an iron piece shaped and fitted in its place in a welder's shop. This improvisation served us till the end

and was changed only after reaching U.K. From now on we were very careful in checking the nuts and bolts during every halt !

PARLE VOUS FRANCAIS

From Iran we went to Iraq and entered the Arabic world. We could understand a little bit of Persian which is the language of Afghanistan and Iran because of our associations with Urdu but Arabic was totally new to us. Our little notebook which contained some common useful words of every language and their equivalents in English came in handy. Anything beyond the scope of our encyclopaedia was expressed in broken English intermingled with all sorts of gestures and signs. Often it used to be a source of amusement to all, when we tried to argue about anything with them. People used to gather round just to hear us speak a few words of their language. English is not so common as French in Western Asia or Europe. Invariably we were shot at with 'Parle Vous Francais' everywhere. Our ready answer to this 'Nai Parle Anglais' was received with a shrug of shoulders expressing the hopelessness of the situation. English-speaking people could only be found in the tourist bureaux, hotels, banks and the like. Impressed by the utility of learning French we purchased an English to French book in Baghdad. The irony of the whole thing was that while we carried that book around everywhere, it was lost the day we entered France.

In Iraq and Syria we had to do a journey of about 270 miles through the desert. We kept our fingers crossed throughout for fear of any punctures which would have been real trouble. We thanked our stars and also the motor-cycle once we crossed the desert. After staying for a few days in Syria, Palestine and Lebanon we went on to Egypt and saw the pyramids, the Sphinx and the Cairo museum.

In Beirut we purchased some Turkish liras in the open market where the currency of every country is available in exchange. We were advised to do so by our Military Attache in Turkey because of the unfavourable rates of exchange prevalent inside Turkey. It was three times as costly to purchase Turkish liras inside Turkey as it was outside. There were other countries also where the currency was inflated, e.g., Pakistan, Yugoslavia and Greece. We always used to study the currency regulations of countries before entering them. We found it profitable to exchange money before we entered a particular country. Our travellers' cheques were honoured everywhere and even the shopkeepers in the small towns accepted them in place of cash.

OVER TO EUROPE

The roads were gradually becoming better and we were having smooth going. They were so well signposted after Turkey that there was hardly any need to consult the map or ask anyone the way, while hitherto we had to rely solely on our maps and milometer for our position, route and distances. The change in the standard of living was also evident. While previously the villages were untidy, showing signs of poverty and were sparsely inhabited, we found considerable improvement after Istanbul.

By the time we crossed into Europe we had finished two months of our leave. We realised now that it would be better to see more countries than we had planned originally and to see them thoroughly instead of rushing on straight to London. By deciding to do the return journey by ship from Genoa to Bombay we could save about 1½ months.

We were fortunate to witness and take part in the enthusiastic reception our Prime Minister had in Yugoslavia on his trip to Russia. It was not unusual to be mistaken for his entourage and be very well looked after before we knew what it was all about. Once a Yugoslav Army Major going in a jeep helped us with a liberal tankful while we were stuck a few miles short of Nis for want of petrol.

We were quite cosmopolitan in our food habits so that we could make ourselves at home with any type of dish that was set before us. We tried once to cook some Dal and Rice on our stove and enjoyed the preparation although it was only half cooked. Thanks to the hospitality of our military attaches and First Secretaries en route, nice Indian dishes were not a rarity, so much so that we had even fresh mangoes from India in Berne, Switzerland. In the Middle East tea is taken without milk. In the beginning we did not relish the idea very much but became accustomed gradually to gulp glass after glass of black tea. In Europe water was a problem instead of milk. We hardly saw people drinking water because of the better substitutes they had in beer, wines and other light alcoholic drinks. So don't be surprised if the hotel waiter does not automatically serve water on the table or gapes at you while you ask for it because he believes in the utility of water for washing purposes only.

July and August are months for holidaying in Europe. There is maximum tourist activity in these months. From all parts of the world they come to visit Italy, France, Switzerland and other beautiful countries. The hotels, holiday camps and pleasure resorts on the lakes and beaches

are full of holiday makers who want to enjoy themselves to the maximum before they go back to their jobs. Even an ordinary workman makes it a point to visit a few places during the three or four weeks' holiday he gets in Summer every year. There are some concerns which give enough advance of pay to their employees for such vacations.

We reached England after about two and a half months of motor cycling and stayed there for about three weeks before our return journey. We utilised this time in getting the motor-cycle overhauled, visiting museums, art galleries and various academies. At this stage we were informed that our return journey by ship was impossible as all the sailings due East were fully booked till October. Some of the companies had finished booking more than 6 months in advance of the sailings. These uncertainties we had to accept in a motor-cycle trip. However there was not much damage done as we found a better substitute in a 4 engined Skymaster of the IAC which was on a chartered flight from Amsterdam to Bombay. We were charged the same fare as the tourist class sea passage and enormous luggage allowance was also made. As it was hardly a day's flight we were able to utilise even the last days of our leave in Europe. After about 30 hours flying and another 40 hours by train we were back again on our jobs.

ATOMIC WARFARE AND CONVENTIONAL FORCES

MAJOR O.D.P. RATNAM

" Hell and destruction are never full ;
so the eyes of man are never satisfied "

Proverbs

OPINIONS on the effects of nuclear weapons vary from the world-wide destruction of civilization to their tactical use on the battlefield by means of an ordinary artillery shell. Destruction becomes effective only when active defence has failed. The present problems on defence do not arise so much out of the destructiveness of the nuclear weapons as from the speed of modern aircraft and the various electronic devices which assist them to reach their targets accurately with almost supersonic speeds.

In the history of this world, all arms' races have invariably ended in some war or the other. But, in the present race, there is a change in the outlook and, therefore, a hope for humanity. The fact that war can be and has become so destructive that even a theoretically superior enemy can expect only complete annihilation in an atomic conflict has checked the temptation for an all-out war. There can be no real victor in such a war. The hydrogen bomb has affected the thinking of some people so much that they have even started doubting the justification for maintaining a conventional army in these days.

The purpose of this article is to consider the necessity or otherwise for present-day forces to be equipped with conventional weapons.

TYPE OF FUTURE WAR

Before we consider the necessity for a conventional force, it is necessary to forecast the type of warfare which is likely to be fought in the future. War, to be of any value, should be an organised action, with a definite aim and as such it would not pay to have chaos all around.

Let us assume that a future war will be fought with hydrogen bombs (possibly even Cobalt bombs), guided missiles, various other atomic shells and thermo-nuclear weapons equivalent to many million tons of High

Explosive. The original Hiroshima bomb was equivalent to some 20,000 tons of TNT. It has been calculated that six hydrogen bombs would be sufficient to destroy all the main industrial and Communication centres in Britain, containing half the population of Britain. Besides the physical destruction, the effect on the morale of the public will be terrific ; people will become submissive. And there will be chaos.

Nothing is known about the ' nerve gases ' and bacteriological weapons. There will be faster and higher flying aircraft, air to air and ground to air missiles and other electronic devices of better accuracy and greater power. We can presume that there will also be greater improvements in the future in defensive strength as compared to the offensive strength.

RETALIATION IS REAL DEFENCE

To stop these bombings, the air defence should be cent per cent effective in interception. But this is impossible. The best that can be done now is that only one out of every four fast bombers can be intercepted. It follows that despite all early warnings, precautions and good interceptions, the hydrogen bomb will still be able to reach its target. But, this is only looking at it from a defensive point of view. Supposing the country which has been attacked is soon able to hit back with hydrogen bombs, then the opponent or the aggressor would be more or less in the same hopeless condition as there will be widespread destruction in his country too. In other words, there will be mutual destruction. The natural deduction is that there must be the power of retaliation for any nation to check the aggressor. It is not correct to assume that a nation will be completely destroyed in the first initial raid, because aircraft with hydrogen bombs can always take off from places (or aircraft carriers) which have not been affected by the raid. It will be physically and economically impossible to bomb every place covering the whole country. From this it can be concluded that to avoid complete annihilation, a country must have the power to retaliate immediately and this means the maintenance of many air-fields, dispersed all over the country.

POWER OF SURVIVAL IS A DETERRENT

The power to retaliate will become effective only when the nation is able to survive after an atomic attack. There will be a temporary phase when there will be chaos and the nation must gather all its strength and resources to tide over this period and reorganise to survive. This period has been called the ' broken back phase '. Once the nation

has survived this shock there will be the opportunity for retaliation. In short, the nation which has better chances of survival is in a better position to retaliate and hence the power of survival becomes a deterrent.

Survival is like a withdrawal operation ; while preparations are going on furiously at the main defensive position, the short term policy of delaying the enemy and preventing him from advancing to the new main position is being carried out simultaneously. The aim should be to survive as an organised force after an atomic attack.

CIVIL DEFENCE

The civil defence has to be thoroughly organised on the lines of the services so that it can take over during the "broken back phase" period. It has assumed such importance that it must be considered as the fourth service. The main function of the civil defence force will be to enable the nation to survive after an atomic attack. To carry out that function, it has two important tasks. First is the dispersal of industry and population, and second the rescue and treatment of the atom-bombed population. It must ensure that production does not stop; production centres have to be dispersed and even go underground. An efficient early warning system must be organised especially in these days of supersonic aircraft. The public must be educated. The country must be divided into different commands and organised strictly on the same lines as in the Army. It has to be a separate service—the civil defence force.

ATOMIC WAR UNLIKELY

With all these terribly destructive weapons, any nation will hesitate to start an atomic war when she knows that the other nation possesses the power of retaliation. It is possible that, in a future war, hydrogen bombs may not be used after all, just like gas which was not used in the last war.

NEED FOR CONVENTIONAL FORCES

Whether the future war is an atomic one or not, there will always be the need for conventional forces. In an atomic war, we will require the conventional forces to follow through, after a hydrogen bomb has been dropped. Moreover, we cannot rely solely upon the threat of a weapon which we might never use. But the conventional forces will have to be reorganised to be more mobile and self-supporting. Obviously, no nation would like to maintain two types of armies—one for an atomic war and another for the conventional war. So, a balance has to be struck between the two.

REORGANISATION OF THE ARMY

Nuclear warfare demands the highest possible mobility. The days of set-piece battles are over. The Army will have to be more mobile and more streamlined, with small highly mobile independent groups to follow up after the atom bombs have been dropped. Emphasis should be on more armoured and airborne forces.

The anti-aircraft gun has become almost obsolete. It can fire, however, atomic shells to burst in the air to stop the fleet of enemy aircraft. How effective this will be is still to be seen. Soon, guided missiles will take the place of artillery.

To make formations more mobile, the administrative tail will have to be cut down drastically to the bare minimum. The main reorganisation would be in the supply echelons. One or two echelons in the supply link can be removed. The present number of administrative personnel and vehicles must be cut down. There are far too many road bound vehicles which should be got rid of and the result will be a proportionate trimming of EME units and other services. Air lift should be used to the maximum for supply and reinforcement. Supplies instead of going through various depots and echelons should be sent direct from the factory to the combat unit thus avoiding the intermediary organisations. This, of course, will mean a demand for better rail and air communications.

THE NAVY

The task of the Navy will not change, but the types of vessels will. The days of the battleships and conventional cruisers and destroyers seem to be numbered. The main vessels would be aircraft-carriers, ships equipped with guided missiles and anti-submarine vessels. The aircraft-carrier will be the spearhead for all naval operations. The role of the Navy would be to secure sea communications and to maintain a series of mobile floating air bases for launching aircraft to drop hydrogen bombs. There is also the task of keeping the nation supplied with all materials and equipment, especially during the "broken back phase" period and to carry out this task, the merchant navy would still be necessary. The Navy will probably consist of a number of carrier task forces which should never be large enough to be an atomic target. The naval carrier tactics will be revolutionised in that the Navy will now have to provide floating bases which should be difficult to locate, move fast from place to place and be ever ready to launch an atomic attack at short notice and also be capable of looking after themselves.

THE AIR FORCE

The Air Force has a large share in atomic warfare. It must, first of all, maintain the power of retaliation. To do that, it must concentrate on a huge bomber force capable of dropping hydrogen bombs quickly, accurately and at long ranges. Then it must provide an efficiently organised air defence of its own country and own air bases. It must have fighters capable of flying at supersonic speeds in all weathers. Actually, the emphasis is not on the large number of aircraft a nation maintains but on the number of nuclear bombs it possesses. The air bases should be well dispersed in such a way that the striking power of aircraft from all these bases is interlocking. To transport the army anywhere, the Air Force must maintain a large transport force.

CONCLUSION

No nation is likely to be desperate or foolish enough to start an all-out atomic war, if only because it has not yet been possible to control the effects of 500 miles of radio-active fall out. Power of retaliation is the real defence. A nation must be capable of surviving after an atomic attack, and to survive, the civil defence force must be organised and treated as the fourth service.

Whether there is an atomic war or not, conventional forces will still have to be maintained but they need to be reorganised. They must be more mobile and better streamlined. The assumption that nuclear weapons can be restricted to tactical action is wrong because the local tactical effort can be easily converted into a strategical one and it will be difficult to distinguish between the two.

In the Army, tactics should be such as never to present a big target inviting an attack by nuclear weapons. Hence, it will be useful to have highly mobile, small, self-contained Brigade groups and a Zone Commander controlling five or seven Brigade groups. The idea should be all teeth and little tail, as far as possible.

All these defensive measures for survival and retaliation will entail very heavy expenditure which will no doubt shatter the economy of an average country. So, a balance has to be struck between heavy expenditure and maintaining the power of retaliation. Countries which cannot afford this will have to find comfort in the Biblical saying "Blessed are the meek, for they shall inherit the earth."

RESCUE AT ROHTANG

BRIGADIER B.M. KAUL*

SEVERAL National Volunteer Force Camps are being organised all over the country in order to discipline our people and develop in them a feeling of self-reliance so that they may be usefully employed in various national development projects. Over 50,000 men have already received training under this scheme in the last six months in camps spread all over India. One such camp was established at Kyelang, in Lahaul, at a height of 11,000 feet, on 10 Sep., this year. The training staff was sent by us, composed of ex-service personnel and civilian non-combatants, all the way from Amritsar. It was perhaps too late in the year to set up this camp as there was the possibility of snowfalls in Lahaul and the Rohtang Pass becoming impassable.

One night, just before this camp concluded its 30 days training, all its inmates went to bed wondering at the mildness of the weather. Here they were, some of them said, at an altitude of 11,000 feet, in October, without much warm clothing and yet it was almost like being in Amritsar. . . . but one of them woke up with a start later that night and saw through the chink of his tent flaps flakes of snow falling outside. And, to the horror of all, by dawn, the camp was buried under what was perhaps the heaviest snowfall Kyelang had experienced for years. With great difficulty these men extricated their weapons, equipment, stores, rations, clothing and themselves from this ocean of snow which surrounded them and withdrew to a village called Tandi, about six miles west of Kyelang where they took shelter in the huts of the local inhabitants. The trainees dispersed back to their neighbouring homes.

For three days the orgy of heavy snowfall continued and the whole of Lahaul valley was like a mass of white nightmare. There was about fifteen feet of snow all round. And the picture of devastation was completed soon after when the bridge on the main Kyelang-Rohtang route over the rivers Chandra and Bhaga collapsed on 8 Oct., severing the only link between our men and India.

Imagine the plight of these men. Their rations were running low and they had insufficient clothing for arctic conditions of weather. We had

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sent warm clothing for them sometime in September but due to floods in the Punjab and the consequent dislocation of traffic both by road and rail, this consignment was held up somewhere and had never reached its destination. And now, with the bridge near Tandi gone, these men were in a jam, good and proper. One more heavy fall of snow and they would be stranded for the whole winter, as the Rohtang Pass would then become impassable until June, and have lean chances of survival.

I learnt these facts on 12 October from a telegram which Capt. Trilochan Labh Singh, Commanding these men, had sent to me from Tandi. This telegram created two immediate reactions on me. Firstly, that the lives of these men were in grave peril and must be saved at once. And, secondly, I felt a pang of conscience for having sent them to Lahaul, against the advice of some who had feared disaster at this time of the year..... which I had brushed aside for the wider interests of the National Volunteer Force Scheme. Be that as it may, I felt quite convinced that it was now my personal responsibility to rescue these men. Accordingly, I sought permission of Government to undertake this mission. This was readily granted. I then asked Lt. Col. B.S. Chand, Vr. C, lately my GSO 1 and now with the MS Branch, if he would like to join me in this venture. He jumped at the offer.

I was advised by some not to embark upon what they said was a foolhardy expedition as not only was the Kulu-Manali road out of action due to recent floods and rains but also the Rohtang Pass would be impassable as it was covered with eleven feet of snow. According to them, I would only be held up somewhere between Pathankot and Manali for days on end and then come back, having spent all this time...in vain!

Lt. Col. Chand and I, having worked together intimately for about a year at the Army Headquarters, knew each other well and therefore viewed this problem quite differently. And so, crossing our fingers, with various fears in our heart but determined to have a crack at it, we both left Delhi on Sunday, 16 Oct. at 1-30 p.m., by a specially chartered IAF "Devon". Just before leaving, I sent a telegram to Tandi, telling our men I was coming to rescue them wherever they may be, and that they should try and reach as near the Rohtang Pass as possible.

We landed at Pathankot just before 4 p.m. Collecting some items of snow and medical equipment and transferring ourselves into a jeep, we left for Palampur where, after many delays on the road, we reached

at about 9 p.m. No one quite knew the state of the road beyond Mandi and hence we marshalled a party of one JCO and five other ranks from 2 Kumaon to go ahead of us and remove any minor impediments which might be blocking our way. Fortunately the road, though very rough, was passable right up to Kulu where we reached at mid-day on 17 Oct. Here the local civil and PWD authorities told us that the road upto Manali was full of breaches and was quite impassable.

Leaving our road escort here, Lt. Col. Chand and I decided to walk this bit as time was getting on and we were anxious about the plight of our men. No one quite knew whether they had left Tandi or how they were.

We left the outskirts of Kulu at about 4 p.m. and began the second phase of our journey. Wading through several raging torrents, in pitch dark night by aid of ropes and tree trunks perched precariously across them, struggling across knee deep slush and quagmire, going up and down trackless ranges, as the road had disappeared for miles at places, we reached Kothi, at the foot of the Rohtang Pass, by the following afternoon, after a 32-mile trek covered in twenty-five hours. A howling gale greeted us at Kothi. It raged all night and made our start the next morning very chilly. Just before we left for the Rohtang Pass, our porters showed signs of panic as they doubted their chances of survival at or beyond the pass due to the severity of weather at the time and the heavy snow which lay all over. However, after much cajoling and on being offered certain concessions, they agreed to move on with our baggage towards the Pass.

The assault party consisting of Lt. Col. Chand and myself, one medical orderly and two sepoy left Kothi, the altitude of which is about 7,500 feet, soon after 4 on the morning of 19th October. We also had with us two 'Sherpa' type of messengers so that they could carry our messages, if any, either towards Tandi or Manali and bring from there any communications meant for us.

We climbed up to about 10,000 feet over steep rock after which snow, hardened into ice, lay in our path which, as a result, was extremely slippery. Slowly we struggled on to a point about 11,500 feet from where the final leg of the zig-zag ascent to the Pass seemed ever so far away. There was a gale which raged all the way from Kothi, but when we were about 2,000 feet from the Pass, a blizzard of about 80 m.p.h. overtook us. So fierce was its velocity that many articles of our baggage went flying away

from our porters into the yawning 'Khuds' below. The climbing sticks we were carrying were torn out of our hands by this furious wind and we managed to prevent ourselves from being bodily lifted into space, and hung on to our ground with the utmost tenacity. We carried on, step by step, with great difficulty and came upon a hundred-foot wall of ice which we climbed with the assistance of ice axes and at a snail's pace, slipping constantly over the icy surface of our perpendicular path, hanging on to dear life for all we were worth. It was here that we came across the body of a civilian doctor, about 35 years of age, lying frozen to death under a huge ice boulder, and met two Lahaulis trying to slip down the wall of ice we were scaling, howling aloud as they slipped, inch by inch, for fear of death, which lurked around every corner of this hill, as one false slip meant a fall of over, 3,000 feet in the 'Khud' below. The storm raged on and huge bits of snow and rock began to be dislodged from up above and came roaring down upon us. There was nowhere we could take shelter as the whole mountain was a block of sheer ice. Our progress was becoming slower and the intense cold was paralysing our whole system. Our limbs seemed lifeless and we began to see visions of freezing to death like the unfortunate doctor whose corpse we had seen a little while ago.

At about 12,000 feet we were confronted with a 'nulla' lying treacherously across a steep slope over which it was easy to slip down to infinity. When we were about 500 feet from the top of the Rohtang Pass, the strain of fighting through a blizzard for over five hours and struggling through slippery ascents covered with ice for several thousand feet, began to tell upon us. However, we knew we had to carry on somehow and help our men across this Pass and so smiling feebly at each other we literally dragged ourselves slowly until we reached the top of Rohtang at 17.00 hours just before dusk.

Rohtang Pass is just short of 14,000 feet in altitude but is over-hung by mountains in the immediate vicinity rising upto 21,000 feet. It is about one mile long and a thousand yards wide, and presented a majestic, though frightening picture of a mass of snow and ice, both on the ground and in the adjacent ranges from top to bottom. Our problem was whether to go on to Koksar, another five miles, at this time, when it was just getting dark and when the path on which we were to go had been obliterated by fresh falls of snow and risk slipping down the icy slopes in pathless terrain to certain death.....or, to spend the night, sitting in a

howling blizzard and arctic temperatures of the Pass itself. After a few minutes of deliberation, I decided to spend the night at the Pass.

To our pleasant surprise, six out of our fifteen porters who had lagged behind had turned up, out of the blue, as a miracle, just before the Pass. They happened to be carrying things which alone could have saved our lives that night. For instance, they had with them axes, picks and shovels; tea, sugar and milk; a tin of kerosene oil and a stove. Our food and bedding were with the other nine porters who, after a flying start over us from Kothi, had gone on to Koksar!

We then began to look for a place of shelter, with the aid of torches, as it was pitch dark by now and, in the process, frequently slipped into crevasses several feet deep from which we had to be hauled out with difficulty. After that we kept a rope handy wherever we went, so that if we disappeared into a deep crevasse, we might be pulled out with the aid of the rope. After searching around for a while, we saw something sticking out of a heap of snow which, on being cleared, turned out to be the top of a hut with a tin roof and brick walls, lying buried in 10 feet of snow. We unearthed its entrance with the aid of axes, picks and shovels and found it was full of ice and snow inside. After struggling for several hours, we made just sufficient room for squeezing ourselves in and finding some sort of shelter from the ravages of the weather outside. We then went through a night of terror, during which we survived with great difficulty. Our feet were swollen and painful. Our eyes ached and were blood-shot. And, generally, we were far from well.

It is a strange thing how in adversity men come so close to each other. The same porters, whose panic knew no bounds some hours ago, now finding themselves in this tight corner along with us, became extremely friendly to us. This feeling of comradeship further improved when we shared our tea with them a little later... the preparation of which was a long and laborious process, using empty milk tins as boiling pots and melting ice into water. The swelling of our feet was getting worse as the snow which had crept inside the soles of our boots began to melt. At about midnight, as if we had not had enough of adventure, a bear tried to get into this hut, as perhaps he did on other nights, but fortunately for us, turned away on seeing strangers intruding in his haunt.

We never let humour desert us in our moments of distress when life seemed to be oozing out of our bodies, and kept cracking jokes at each other.

This helped us to pass the time which otherwise seemed to be crawling painfully.

As the day was about to break, two porters volunteered to go down the hill and see whether there was any news of the men we were seeking. In the meantime, we also went across the Pass towards Koksar, looking anxiously for our men. Suddenly, we sighted a lonely figure coming towards us. He was a sturdy NCO who was the leading scout behind whom came, in small groups, members of the NVF Team, struggling up this treacherous Pass slowly. Shortly afterwards, we met all these men along with their Commanding Officer, Capt. Trilochan Labh Singh, just on the far end of the Rohtang.

Some touching scenes took place at this point. These ill-clad, physically tired and half-starved men, many of whom were temporarily snow-blind, with blistered, bleeding or frost-bitten feet, showed signs of visible emotion at seeing us in this death trap. Many broke down in greeting us. Most of us looked pretty grim, with the skin of our faces having cracked up and bleeding, due to exposure to icy winds.

Once the emotional stress was over and after a brief rest at the top of the Rohtang Pass, I organised them into several parties under the charge of competent and fit NCOs and warned them to go down the numerous "walls of ice" from Rohtang to Kothi with care. These men who had been through untold hardships in the last few days then started the hazardous journey down the Pass. Many of them had to be helped. Others managed it themselves. There were some sights which can never be forgotten. For instance, an old civilian non-combatant, about 55 years of age, was egging on another equally old but frightened companion, who was at the end of his tether, to buck up and carry on somehow. Both were tired. Both were physically injured but one had given up hope while the other's morale was still high. After much mutual assistance in slipping down many "ice traps" from which one false step would have led into a yawning abyss thousands of feet below, the party reached Rahla at 18·00 hours, where, to our horror, we found that these two men were missing. The prospect of going back to the Pass to search for them was, to say the least, terrifying after such a hectic time. However, there was no question of leaving these men in the lurch. The search party, therefore, set out at once and fortunately found these men within half a mile. By 21·00 hours everyone had been brought back safely and tucked into the dak bungalows

at Rahla and Kothi within two miles of each other, where they were given hot food and steaming cups of tea.

On 21st October we all reached Manali. I instructed Captain Trilochan Labh Singh to stay on with his men at Manali until they had thoroughly recuperated from their recent ordeal, when I promised them one month's leave. And after complimenting all ranks for the heroic manner in which they had come out from Lahaul, I, along with Lt. Col. Chand, started on our return journey. Once again, going across the hills, through slush and quagmire, over flooded streams and after another trek of about 24 hours, we reached Kulu at dawn on 22 October. We then jeeped from Kulu to Pathankot, where we missed our train for Delhi. After a 75 mile chase in the jeep we caught this train at Jullunder at 22.00 hours that night and reached Delhi on the 23rd morning.....after an amazing escapade.

TRIBES OF THE NORTH-EAST FRONTIER

SQUADRON LEADER D.R. SETH I.A.F.

THE north-east frontier is the tract which embraces the whole of the hill-ranges north, east, and south of the Assam Valley, as well as the western slopes of the mountains dividing India from Burma.

Recently this borderland came very much in the public eye and the Indian people became aware of the problem facing the Government of India there, especially after the disaster which an Indian army expedition met with in those hills two years ago. But unfortunately very little is known about the topography of the region and about the many interesting peoples living there, although from the military point of view this region is of the greatest strategic importance.

In this article I shall attempt to describe the life and society, the religious beliefs and methods of making war of the peoples living in these hills. In doing this I shall proceed in regular order, first traversing from west to east the ranges north of the Brahmaputra, then turning west along the ranges that bound the Assam Valley on the south.

There are eight main tribes living in this region :—The Daphlas, the Miris, the Abors, the Mishmis, the Nagas, the Khasis, the Garos and the Lushais.

THE DAPHLAS

The Daphlas live in the hills north of Lakhimpur, from Bharoli river in the east to the upper reaches of the Sundri. Their country like the rest of the border is hilly, densely forest-clad, and inaccessible. They are not so much a single tribe as a collection of petty clans, independent of each other and generally incapable of combined action. Each tribal sub-division has its own 'Gam' or chief.

Appearance, Dress and Food

The Daphlas are a people with Mongolian features, well built and of average height. Their dress is most meagre. The upper part

of the body is covered by a sleeveless coat while their legs are always bare. They cover their middles by a sort of 'langot.' When danger threatens they wear hide and cane armour.

They do not have any hair on the face. The head-hair are pulled to the front and tied in a knot over the forehead.

The Daphla food is of the simplest. They eat meat of all types. They drink a sort of fermented beer made out of millet.

Village Communities

The Daphlas live in villages which are a mere collection of long-houses, built on piles. The joint family living under the same roof is the primary social unit; so much so that in time of war individual long-houses are regularly attacked and burned while the rest of the settlement is not only unmolested but makes no attempt to intervene. The villages are unstable entities from which families can easily detach themselves and move elsewhere. The houses are deliberately of flimsy construction so that the inmates can escape easily in case of a surprise attack, and in many places they are occupied only during the day, the people sleeping in the woods at night for fear of raiders.

The Daphlas use a primitive system of slash-and-burn cultivation, the fields being tilled by women and slaves. Their material culture on the whole is very poor.

Daphla Society

They are ploygamous, but exogamous. A man can marry any number of wives. But the first wife remains the head-wife who rules the family. Head-wives are fair game in war, while the lesser wives are not. Lesser wives are sometimes sold as slaves. Both marriage and divorce are very easily arranged.

Their religious beliefs are most primitive. They believe in spirits and are animists.

Weapons

The Daphla weapons are bows and arrows, which they use with deadly accuracy, and spears. They also use oblong hide shields and leather corselets.

THE MIRIS

The Miris inhabit the plains and lower hills, along the north bank of the Brahmaputra, between the Subansiri and the Dihang rivers.

Appearance

The Miris in appearance are Mongoloid, but their faces are by no means unpleasing. They are powerfully built with well-developed limbs and their faces generally have a ruddy hue. They are cleaner in their persons than most other hill-tribes. The Miris living in the plains have come into contact with civilising influences and have thus acquired settled habits. They graze goats, pigs, and cattle and raise crops of rice, mustard, millets, pulses and sweet potatoes. The same cannot be said about their brethren in the hills.

Their diet consists of fish and flesh and the food crops they cultivate. They are very active in their habits and enjoy an enviable immunity from disease.

Villages

Miri villages are built in two long rows along a central path. The houses are long and narrow, sometimes as much as forty yards in length, with accommodation for thirty or forty inmates. They are raised on piles. This is due to the fact that the Miris as a rule settle upon the alluvial islets in the rivers, in which they fish, or upon the banks of marshes.

Social Customs

Old customs of the tribe have given place to Hindu observances in matters matrimonial. Marriage is an expensive affair and means considerable expenditure on food and entertainment. The custom of "badla" prevails among the Miris. The marriage of a young man cannot take place unless at the same time a girl belonging to the bridegroom's family is promised to some male member of the bride's. In many cases the marriage is by purchase; in others by service.

The plain Miris call themselves Hindus. The others are Animists sacrificing to the sun, moon, and earth. They believe in the existence of spirits which can be conjured by spells and compelled to appear before men. They also believe in beneficent gods, who entertain friendly feelings towards men.

THE ABORS

The Abors have always been the cocks of the north-east border. They are independent and quarrelsome and regard themselves as the rulers of that corner of India.

The land of the Abors lies between the eastern watershed of the Dibong river and the western drainage of the Subansiri river. It extends from Brahmaputra in the south to the hills dividing Assam from Tibet in the north. Although it is only a few hundred miles square, it comprises between the slopes of the snow-clad northern mountains and jungle-covered banks of the Brahmaputra, some of the most difficult country in the world for military operations. There is a complete absence of roads in the area.

The Abors are divided into a number of clans, of which the principal are the Minyongs, Padams, Pasis and Gaylongs. Clan feuds are very common among the Abors and they very rarely combine together.

Life and Society

The Abors are a people of Mongoloid descent, but are tall, lithe and active with well-developed bodies. They have brown eyes, high cheekbones and black hair which they keep closely cropped. Both sexes tattoo. The Abor language is a form of Tibetan. They are slow talkers. They speak in a sonorous tone very clearly and distinctly, and with deliberation.

The Abors live off the smaller wild life of the jungle and favour frogs, lizards and mice. They do not reject dead animals. They like their food smoke-cured and do not use water in its preparation. Both men and women are great smokers. An Abor and his pipe are never parted.

Both men and women dress very scantily. The only piece of covering used is a loin-cloth of bark. Some men wear a sleeveless jacket, and some more sophisticated women, a cloth skirt.

Ornaments which men and women wear are mostly made out of bamboo. Ankle-bands, girdles and jockey-cap hats are all made of bamboo. The hat is generally decorated with cock's or crow's feathers.

The religion of the Abors is animist. Belief in Spirits, both good and bad, prevails, in the same way as in the case of other hill tribes.

Village Communities

An Abor village is an entirely independent community over which the 'Gam' or headman exercises absolute authority. The houses are raised on piles, a few feet from the ground. The roofs and walls

are made of plantain leaves. The floors are of bamboo. The space beneath the house is used as a latrine or a lumber room and also for keeping poultry and pigs.

In the heart of every village is the "moshup" or community centre, used at night as bedroom by the unmarried men of the village.

Weapons

For arms, the Abors use bows and arrows with poisoned tips, long spears, daggers, dhaos and bamboo shields. They are experts in building stockades of great length and thickness, and laying "booby-traps".

In addition to ambushes, the Abors rely largely on their prowess as bowmen and spearmen. Being excellent archers they can pick up an object with unerring precision at a couple of hundred yards.

THE MISHMIS.

The Mishmis are settled east of the Abors. The country is mountainous, greatly cut up by water courses and difficult of access. The mountain valleys are covered with dense jungle. The trade is poor and cultivation scanty.

The People

The Mishmis are Mongoloid in features, light complexioned, small in stature and of picturesque appearance. Their manners are as simple as their clothing. Less naked than the Nagas, their dress resembles that of the Abors. It comprises a short sleeveless jacket and a short skirt. Their head-dress follows the mode of the frontier and consists of a cane helmet adorned with feathers and beads. They keep their hair cut in a straight fringe across the forehead.

The domestic life of the Mishmis does not resemble that of the other hill tribes. Polygamy is popular and widely practised. At the time of marriage the husband has to give many presents to his wife's family. Divorce is common and very easy to get.

Village Communities

The Mishmi villages are smaller than those of the Abors and the Miris, seldom numbering more than a couple of dozen houses. The villages are also not adapted for defence like those of the Abors.

Their houses, too, are differently built from those of their neighbours. Like their villages they vary in size, from forty to two hundred

feet in length. But they are all about twelve feet in width. As a rule they are raised on piles four feet from the ground, the space beneath being used for keeping pigs and poultry or refuse. The interior of the house is divided into narrow compartments according to the number of wives, a narrow passage running the whole length for exit and entrance.

The houses are mainly built of bamboo with thatched roofs, so low that it is difficult to stand upright. Each house is built on its own plot of land, isolated from the neighbouring houses and screened off by trees and bamboo screens.

Weapons of War

The most important weapon is the dhao. They also carry bows and arrows with poisoned tips. In war time they use shields and spears. The spears are not always carried about like the Nagas, but only with full war-dress.

THE NAGAS

Running southwards from the eastern end of the Himalayas are mountains dividing Assam from Burma. At the northern end of these ranges the valley of the Brahmaputra makes a deep inroad into the hills. It is in the hills immediately to the south of this valley that the Naga tribes have their present homes.

The Nagas are a very happy people, fond of singing and dancing. Hence they are called the "Merry Nagas".

The Naga tribe is divided into several clans—the Kachas, the Angamis, the Regmas, the Semas, the Konyaks. The Angamis are the most important section and have a culture superior to that of the other members of the group.

Appearance

A typical Angami Naga is tall, well-built and has great powers of endurance. He has pleasant and sometimes decidedly handsome features and a musical voice. The flattened nose and slightly oblique eyes of a Mongolian type are more common, although Aryan types with straight eyes and noses are also found among them. The Nagas do not have hair on the face, and beards and moustaches are seldom seen.

The Naga women do not compare with the men in looks. They are seldom pretty, and very quickly lose whatever looks they have.

The Nagas as a rule are clean and wash frequently even in cold weather. They also keep their teeth clean.

There are many different styles of hair-dressing in vogue among the Naga tribes. The Angamis let their hair grow naturally while tying up a small knot at the back. In the front a fringe is worn without a parting by the unmarried men, while the married men brush their hair back from the forehead, often parted in the middle.

Dress

Many varieties of cloths are worn among the Nagas, the predominant pattern being black with red and yellow stripes down the two sides. The width of these stripes differs from clan to clan. Whatever pattern of cloth is used, covers only their middles up to a little above the knees.

Naga women wear petticoats of a plain blue cloth and a white cloth with black marginal stripes.

In wet weather a large hat of leaves and basket-work is worn as well as a rain coat of plaited grass.

The Naga ceremonial dress is very picturesque. In the case of younger warriors, a bearskin fringe adorns the front of the head, while the back is bound in ropes of white cotton, the whole being surmounted with a wheel of hornbill feathers. The ears are adorned with rosettes, many necklaces go round the neck, and a special ornament made of different coloured hair and cowries is worn on the breast suspended from the neck. The waist is belted with a strip of white cloth ornamented with lozenge patterns in coloured hair or wool and a tail about a foot long sticking straight out behind.

Food

The staple food of the Nagas is rice. Meat forms an important part of the diet. They have no prejudices as regards the meat to be eaten. Beef, pork and chicken are their commonest meat foods, and these are supplemented by dogs, cats and crows.

Village Communities

Naga villages are designed to protect the inhabitants from the attacks of hostile tribes. Each is a stockaded fortress invariably built on the summit of a hill or spur, the houses being massed together without much planning and the settlement guarded by stone walls, ditches, approaches, and gateways protected by strong wooden doors.

The houses are of the type common among all the hill tribes—long with a narrow frontage. They are all of one storey, on the ground, the bare earth rough levelled forming the floor. The side and back walls are generally made of bamboo, but the front is commonly made of elaborately carved wooden boards. The interior of the house is divided into compartments.

A noticeable feature of Angami villages is sitting-out places, originally serving the purpose of look-outs. Most Naga villages have the "Morung" or young men's house.

Social Organisation

Although each village is an independent political unit the real unit on the social side is the clan. Clans are rarely friendly with each other and fights between them are common.

Women occupy a low position among the Nagas. But they are monogamous and exogamous in their marriage relations. Marriages are performed with great ceremony.

In common with other hill tribes the religious beliefs of the Nagas are very vague. They have faith in spirits and have a clear idea of how gods should be served. The worship of the gods is directed by certain officials.

War And Head-Hunting

The weapons used by the Nagas are spears, dhaos and pole-axes. The spears are excellent specimens of metal-work. The helmet is made of wicker-work or plaited cane, conical in shape and covered with a layer of fur or hair. It is decorated in front with a disc of polished brass.

Head-hunting for which the Nagas were notorious in the past is now happily no more.

THE KHASIS

The Khasis live in the Khasi hills around Shillong. These hills are not so inaccessible as the ranges to the north of the Brahmaputra valley and hence the tribes in this area have had greater contact with the outside world and have acquired a veneer of culture.

Physical and General Characteristics

The Khasis are generally short in stature, with well-fed and muscular bodies. They are cheerful, light-hearted and fond of music. They are

also fond of open-air life and like to spend a day out in the woods, hunting and shooting. They are inveterate chewers of "Supari and Pan." They are hard drinkers, and consume large quantities of rice liquor.

Khasi dress may be divided into two types, ancient and modern. The ancient dress consists of a sleeveless coat, leaving the neck and arms bare, with a fringe at the bottom. This coat has now given place to coats of European pattern in the more civilised centres. The Khasis cover their heads with a cloth cap with ear flaps. White turbans are worn when to look smart is the aim. A piece of cloth is worn round the waist and between the legs, one end hanging down in front like a small apron. The more sophisticated have taken to 'dhoti' or trousers. Khasi women dress more elaborately than the women of other tribes. They have both an under-garment and an over-garment, looking more or less like dhoties but worn in their own distinctive way.

The Khasis are not fond of tattooing but they like jewelry. The women are especially partial to gold and coral bead necklaces.

The staple food of the Khasis is rice. But they are fond of all kinds of meat, especially pork and beef. Unlike the Nagas they do not eat dogs. They do not use milk, butter and ghee as food, except some who have become more modernised.

Village Communities

Unlike the Nagas, the Khasis do not build their villages on hill-tops, but a little below the top, generally in small depressions, in order to obtain some protection from the strong winds and storms common in their homeland. The villages swarm with pigs and are often surrounded by potato gardens.

The houses are built close together. They are as a rule, substantial thatched cottages with plank or stone walls and raised on a plinth some two to three feet from the ground. The only window is a small opening on one side of the house. A fire is always kept burning on an earthen or stone hearth in the centre of the house.

The villages as a rule are not fortified.

Social Customs

The Khasis have a tribal organisation, the family being the basic social unit.

The Khasi society is matriarchal. Thus after marriage the husband takes up residence in the mother-in-law's house, rather than take the wife to his own house. Later when one or two children are born the couple may set up house separately. Neither polygamy nor polyandry prevails.

The Khasis are strictly exogamous; a Khasi cannot take a wife from his own clan. Divorce is common and may be obtained for a variety of reasons, such as adultery, barrenness, and incompatibility of temperament.

As regards their religion, the Khasis have a vague belief in a God the Creator. They believe in spirit worship, or rather the propitiation of spirits both good and bad on certain occasions, especially in times of trouble. They also believe in ancestor worship, and show respect for the dead by offerings. Many Khasis have been converted to Christianity while others have taken up Hindu manners and customs.

War

Although unlike the Nagas and Garos, the Khasis have never been head-hunters, they have been fond of war in the past. From the records of the military operations of the Khasis against the British authorities, the Khasis appear to have relied principally on bows and arrows, ambushes and surprises. During the Jaintia rebellion fire-arms were used. Since then the making of guns and gunpowder has been known to them. Other weapons used are swords and spears. The spear is not decorated with wool or hair like the Naga spear, but is nevertheless a formidable weapon in the hands of a resolute man.

THE GAROS

The Garos have their home in the Garo Hills, which are situated at the western end of the range of hills which form the southern boundary of the Brahmaputra valley.

Appearance, Dress and Food

The Garos are of the stock known as Tibeto-Burmese, which drifted into India and Burma from Tibet. Their language still retains some similarity with Tibetan, and some of their ideas, such as the sentimental value they attach to gongs, are identical with those prevailing in Tibetan villages.

The Garos possess the Mongolian type of features and are darker in colour than their neighbours the Khasis. "Their faces are round and short. The forehead is not receding, but projects very little beyond the eye which is small, on a level with the face, very dark and obliquely set.

The want of prominence in the nose is remarkable. The whole face has the appearance of being flattened, the mouth sharing in the compressed appearance".

As a people, the Garos both men and women, are short, lean and wiry and a fat man is quite a rarity. The men rarely have hair on their faces, though some grow apologies for beards. They have no distinctive manner of wearing the hair which is seldom cut. Men and women wear their hair alike, tied in a knot on the top of the head or behind the neck.

The Garo dress is very primitive. The principal garment of the man is a "gando", a strip of blue cotton cloth interwoven with red bands. It is six inches wide, and about six or seven feet long. It is passed between the legs, and coming up behind, is wound round the waist, the end being tucked in under the folds at the back. On the head the Garos wear a 'pagri' usually of dark blue cotton. A cotton cloth or blanket over his shoulders when it is cold, completes a man's attire. The more modernised Garos wear the same clothes as the Assamese.

The Garos eat almost any kind of animal food, including dogs and cats. Their staple food is rice, but they do not drink milk. They drink brewed liquor, which they prepare from rice, millet or maize.

Village Communities

Unlike the Nagas, the Garos build their villages in valleys, close to running water. Garo villages are rarely on flat ground, as they prefer sloping sites. They are generally surrounded by groves of fruit trees and are built around an open space called "sara."

The houses are built very close to each other, on piles. Timber, bamboo and matting are used as building-material. The houses are long and narrow. There are no windows but only openings in the shape of doors at each end. The interiors are generally dark and gloomy. Young unmarried men do not live with their parents. A separate bachelor's quarter is provided in each village.

Garo Society

The Garos are strictly exogamous, and husband and wife must belong to different septs. The children invariably belong to the mother's sept. For marriage it is the girl who proposes and not the man. The girl does not herself arrange the engagement, but indicates her choice, and enlists the services of her father, uncle, or brother to bring about the alliance. A

man may marry as many wives as he likes. At the time of marriage no money is paid or presents exchanged.

The Garo religion is animist, though many have been converted by Christian missionaries. It consists of a belief in a multitude of good and bad spirits which have to be propitiated and appeased. They also believe in the existence in man of a spirit which, after death, goes to an appointed place, there to dwell for a period before it is re-incarnated.

Weapons

A hundred years ago the Garos were looked upon as cruel and blood-thirsty savages. They were notorious as the perpetrators of numerous raids into the plains at the foot of their hills. But this is all a thing of the past now.

The Garos are still fond of hunting and fishing. The principal weapons are swords and spears, without one or the other of which they are rarely seen. The sword is very quaintly designed and varies in length from three to four feet. A Garo spear is a formidable weapon, with a sharp iron head fitted into a bamboo shaft about five feet long. Bows and arrows are known to them but are seldom used.

LUSHAIS

The Lushais live mainly in the Lushai Hills. But some of them are found in Cachar and the hills beyond the Chittagong Hill Tracts. They are racially akin to their neighbours in the east. This is apparent both in their language and culture.

Appearance, Dress and Food

In appearance the Lushais have a Mongolian type of face, although there are many exceptions due to racial intermixture. "They are a short, sturdy race of men with good muscle development. They have high cheek bones, small almond shaped eyes and short and flat noses. Beards and whiskers are unknown among them. If there are hair on the upper lip they pull them out except those at the corners of the mouth."

Long hair are worn by both men and women, in a knot over the nape of the neck, and carefully parted in the middle.

The dress of the men is very simple, consisting of a single piece of white cloth about seven yards long. It covers the lower part of the body and also the shoulders. In cold weather additional clothing is worn, one over the other, sometimes a coat. All these garments are of cotton, grown

locally and woven by the women of the household. Normally the men do not cover their heads. But during the rains they use hats made of strips of bamboo or cane. As there are no pockets available everyone carries a small cloth bag in which he puts his pipe, tobacco and knife.

Women dress as simply as men. All wear the same costume; a dark blue cotton cloth, just long enough to go round the waist and held by a girdle of brass wire; the only other garment being a short white jacket. On gala days the only addition to the dress is a colourful head-dress worn by girls while dancing.

Ornaments are few and mostly worn in the hair knot. These are two-pronged pins of brass, skewers of ivory, bone or metal and wooden or ivory combs. Men have their ears pierced and wear either small wooden studs or cornelians suspended by a piece of string. Both sexes are fond of necklaces of amber. A tiger's tooth is often hung round the neck as an ornament. With the exception of ear-rings Lushai women wear the same ornaments as men.

The staple food is rice. Though the Lushais are fond of meat and like vegetables, they consider them only a garnishing to their rice. Flesh of all animals is eaten, even when considerably decomposed. Rats of the white-bellied variety are considered a luxury.

They do not drink anything with their meals except water. Intoxicating drinks are taken at leisure. These are of two kinds, the "zee" a simple partially fermented drink, and the "ratzu" which is distilled.

Village Communities

The Lushais like to perch their villages on the tops of ridges or spurs, as the steep hill sides make it difficult to find sites elsewhere. It may also be for the sake of climate, but mostly to get a good defensive position. Now that there are no fears of raids people no longer live in large communities and houses have become dispersed.

Houses are built of timber and bamboo and consist of three parts, the front verandah, the main room and a small closet partitioned off at the far end. The only furniture are a few rough and low wooden stools.

Lushai Society

The Lushais have wide views on matrimony. A young man is not hampered in his choice by any prohibited degrees, family or clan. In

actual practice marriages are endogamous as regards the clan and exogamous as regards the family. A man may marry as many wives as his purse would allow.

The bonds of marriage are very loose and can be easily slipped off. If a couple disagree they simply separate and that is the end of it.

The Lushais are very fond of singing. Their songs are slow, solemn dirges sung to the accompaniment of a drum or gong. Their dances are also slow and monotonous.

There are not many games played, although the men are fond of putting the weight.

The Lushais have no established religion but believe in spirits. Each clan has a special spirit presiding over its destinies.

Weapons

They have been using guns for the last hundred years or so. These are smuggled through Burma and some come from Chittagong. The other weapons used are spears and dhaos. The latter is a more serviceable weapon. Bows and arrows are entirely gone out of use, but were formerly used in the chase, when the arrow-tips were poisoned.

CONCLUSION

I have, in the foregoing pages, taken the reader to a distant and least-known corner of India, which is a veritable museum of nationalities. I have attempted to give a brief description of the appearance, food, dress, social customs, religion and weapons, of some of the important tribes living in that region. They are a people little known to the rest of India, and though living in the neighbourhood of civilised people, have remained free from foreign influences to a remarkable degree. This is partly due to the inaccessibility of their hills and partly to their natural conservatism.

The task of keeping law and order, in the hills inhabited by the tribesmen, is an onerous one. It was begun about a hundred years ago; first by the missionaries, then by government officials especially appointed for the purpose. But much remains still to be done. The tribesmen must be handled very carefully, as though living next to nature, they are passionately fond of their independence. One way would be to bring them to see the blessings of civilisation. High-roads should be built and their country opened up. Employment should be provided for the adult

population, hospitals and schools started, and the natural wealth of the region exploited.

There is evidence that the Government of India is prepared to respond warmly to proposals for reassuring the tribal people that their interests are zealously guarded at the Union Capital. For this purpose, although the government is not prepared to undertake the establishment of a separate hill state they might appoint a new Ministry at the Centre to look after tribal affairs.

SUMATRAN INTERLUDE

CAPTAIN C.L. PROUDFOOT

“**F**ASTEN your safety belts, please.”

The attractive Dutch Air Force Nurse stopped by each passenger to ensure that we were carrying out her instructions, and helped the only woman passenger to fix her strap. The Dakota taxied to the end of the runway and in another minute we were airborne.

The 'plane was a Dutch Air Force C-47 flying from Batavia in Java to Medan in Sumatra. For almost a year after the Allied victory over Japan the sad bitter struggle between the Indonesians and the Dutch had run its bloody course but was no nearer settlement. Nationalist Indonesians, fired with the spirit of resurgent Asia, were determined to rid themselves of their Dutch masters, whilst the latter were equally determined to hold on to their vast riches in the Netherlands East Indies.

British and Indian troops who had come to Indonesia to disarm the Japanese and succour and evacuate Allied Prisoners of War and Civilian Internees were now leaving, their task accomplished. Which was why I was on this 'plane—a Public Relations Officer from the Allied Headquarters in Singapore flying in to “cover” the departure of the last British and Indian troops from Sumatra.

I looked around the cabin at my fellow passengers—a high official of the Indonesian Nationalist Movement on his way from Batavia to attend a “settlement” conference at Medan, the last tripartite conference to effect a peaceful agreement before the British G.O.C. left. Efforts which were to prove futile until the United Nations intervened four years later. The envoy was accompanied by a Dutch Army escort of two Ambonese soldiers; tough, taciturn, swarthy types with impassive faces. The lady passenger was the Envoy's wife and she carried an infant which she breast-fed without the least embarrassment.

A blonde, sunburned Indo-Dutch soldier returning from leave in Sourabaya and I myself completed the 'plane's complement of passengers. This young warrior whose name was (inevitably) Jan, suffered acutely from

nostalgia and spent long periods of the journey gazing soulfully at the photo of a plump pretty girl who, he confided, was his very newly-wed wife. This I had already surmised.

Young Jan's personal armaments gave me many anxious moments. In the course of conversation I discovered that his rifle, which he kept waving unconcernedly in various directions, was loaded. Tactfully I pointed out that the safety catch was forward so he pulled it back to safe with a jovial apology.

Two hand grenades swung nonchalantly from the U.S. Army web belt he wore. Were they by any chance primed? Proudly he assured me they were, and attempted to detach one to prove it to me. When the grenade refused to come unstuck he cursed and began tugging violently at the securing wire. Hastily I assured him that I did not doubt for a moment that the grenades were indeed primed, but it was only with difficulty that I dissuaded him from further efforts to tug one off.

When Jan moved about, as he did frequently, the grenades dangled about dangerously, but as he himself was supremely unconcerned with the possibility of being suddenly blown to bits, who was I to worry? However, I discreetly increased the distance between us.

The Flight Nurse flitted fore and aft between us trailed by delicate wafts compounded of Chanel, Coty and starch. The passengers sat uncomfortably in the metal bucket seats on either side of the fuselage, huddled in a little group against the forward bulkhead.

We were flying high over the dense equatorial jungles of central Sumatra when without warning we were struck by one of the tropical storms which in these parts are remarkable for their suddenness and ferocity. Rain beat a wild tattoo on the metal body of the plane which jerked and shuddered like an animate being in mortal torment. It was impossible to imagine that intangible electrical forces could so toss and buffet this 28,000 lb. aircraft about in the air like a storm-wracked ship in an invisible sea.

But what the sea could not duplicate were the cataclysmic drops of fifty to a hundred feet into the frequent air-pockets. Without notice we fell with sickening suddenness into abyssmal nothingness, leaving our stomachs at the original altitude, and then just as suddenly shooting up again thither to reunite with these vital portions of our anatomy. Somehow we fastened

our safety straps, the Nurse taking care of mother and child and at the same time contriving to help the Ambonese alongside who was retching violently. The Nurse left her charges to get the little white air-sickness bags and distribute them. Jan and I were unaffected by nausea but the rest were soon violently sick.

The Envoy at first tried gallantly to help his wife with the baby and be sick at the same time but had to give up and cocentrare on his own misery. The two Ambonese were wrapped in their own retching. The Indonesian lady got quite bad and the Nurse gave her undivided attention. I there-upon assumed the distasteful task of removing the full bags to the Toilet and supplying fresh ones. It was whilst returning from one of these missions that I saw Jan holding the baby in his arms, tenderly if somewhat inexpertly.

As suddenly as we hit the storm we had left it behind and were cruising along again serenely in bright sunlight. Within a short time the afflicted had regained their composure, still looking very sorry for themselves and a trifle self-conscious. Jan handed back his charge to its mother rather sheepishly and was rewarded with a sweet smile from the mother and a polite word of thanks from the father. The little interlude of the storm had lasted scarcely ten minutes and for that brief interval at least the racial barriers had been lowered.

"Fasten your seat belts, please. We are going to land."

The Dakota circled low over the dense jungle and came down on the tarmac, taxied to the end of the runway, turned slowly and came to a halt near a small corrugated iron hut heavily sand-bagged and wired. This was Padang, where we would make a brief halt before continuing our journey to Medan. The Captain came out of the Control Cabin carrying a brief case.

"You are advised not to leave the aircraft," he said, and departed towards the hut. The Co-Pilot kept seated with the engines ticking over.

Against the Skipper's advice I decided to stretch my feet and climbed out, to find Jan ahead of me. We walked to the end of the tarmac where it met the jungle and got into conversation with a Dutch jeep patrol of the airfield guard. They said the strip had been ranged by Nationalist medium machine-guns in the surrounding hills, and advised us to get back to the plane quick.

We had scarcely turned, before the distant chatter of a machine-gun echoed through the jungle-clad hills, and tracers began to ricochet off the ground near the Dakota. Jan and I started to sprint the fifty yards which separated us from the aircraft, when to our dismay the Captain dashed out from the tin hut, climbed into the 'plane, pulled up the step-ladder and closed the door.

As we reached the 'plane the engines revved into full power and the Dakota's fuselage shuddered violently, but it did not move. Meanwhile another machine-gun had joined in the fun and the tarmac was alive with spitting and whining bullets that threw up little spurts of dust like heavy raindrops whilst the red tracers resembled a Diwali display.

We threw ourselves flat beside the 'plane and prayed ; or at least I did. The engines roared at full throttle but still the aircraft did not move off. Then suddenly the door opened again and the Navigator jumped out and ran forward under the belly of the 'plane. It flashed on me that the wheel-chocks had not been removed. Shouting to Jan I got up and leaped for the hatch and scrambled in, helped by one of the Ambonese. I turned to help Jan and saw him stagger with a queer surprised look on his face.

The Navigator jerked him up from the outside and we hauled him into the 'plane as it started moving. The Navigator scrambled in and swung the door shut. As we taxied towards the end of the runway I saw the jeep patrol through the perspex windows racing off in a cloud of red dust. In a matter of seconds we were airborne again, safe and sound. All except poor Jan. A bullet had ripped through his chest from right to left when he raised his arms to jump into the 'plane. There was nothing we could do for him, and before we reached Medan he was dead.

The Flight Nurse removed Jan's personal documents from his pockets and bundled them up neatly, but the blood-stained photograph of his wife she stitched carefully into the breast pocket of Jan's olive-green tunic. It was a beautiful act of gentle womanly understanding. The Indonesian lady looked for a moment at the dead boy's face, a few moments ago so lively and vivacious, now calm and still in death. She looked away, slowly brushing the sleeve of her muslin blouse across her misting eyes, clasping her sleeping infant closer to her bosom.

Soon we were over Medan, which at that moment was a city of conflicting emotions, seething with doubts and fears and agonised uncertainties ; where so much more adventure was to come my way. But that is another story.

REVIEWS**WAR ECONOMY, 1939-1942**

S. J. BUTLIN

With illustrations, maps and cartoons
Australian War Memorial, Canberra, 25/-

Of twenty-two volumes being published under the title "Australia in the War of 1939-1945", the work under review is the third volume of series No. 4 (Civil). It deals with the war economy from the commencement of World War II to the time when Japan conquered the whole of South East Asia.

The Japanese southward advance indicated that "Australia was at war with the traditional enemy", and that the United States was a full fighting ally in the Pacific. Yet Australia had long before realized that for immediate survival she stood alone. She had prepared herself for this shock, and had built up during the previous two years' breathing space an industrial base and an administrative machinery which proved extremely valuable later on. In this volume is traced step by step the story of this gigantic effort which covers a large field embracing price control, trade, shipping, labour, and problems of supply, production, and manpower.

This gives us a glimpse into the economic history of Australia of the period dealt with, and her economic activity in relation to the war. The author first takes the theme of the formation of economic policy, and treats of its origin as well as its fruition. He attributes the beginning of economic preparations for war to the Imperial Conference of 1937 when the United Kingdom tried to ensure supplies of food from the constituent countries of the Empire and emphasized the need of the Dominions and India being independent for their supplies of arms, munitions and aircraft. In consequence Australia formed a new four year defence programme which gave a fillip to the economic and industrial activity in the country.

The Government was faced with three main problems for increasing the war effort in the first two years of the war—manpower, finance and curtailment of standards of living. In May 1939 a compulsory register of all males between the ages of 18 and 64 was introduced to provide an

assessment of the skilled labour and manpower available in the country. It disclosed an acute shortage of labour. This led to the more effective use of women in auxiliary services, in munitions production, and in replacement of men in civil activities. But the women were not enough, and the Government was compelled to cut non-essential production, and to enforce some order of priorities even among the essential war activities.

The problem of finance involved the checking of future inflation. It was soon discovered that finance implied a technique of control. It meant using monetary techniques for restricting peace-time demands on scarce resources. Taxation was designed to deprive tax-payers of purchasing power to the point where their living standards were reduced. Control aimed at curtailing competition from non-essential activities for material and equipment. War expenditure dominated the public finance figures, which rose from £50 million in 1939-40 to £170 million in 1940-41. The Australian percentage of war expenditure to total national expenditure was above that of the United States, Canada and Japan, and was exceeded only by that of the United Kingdom and Germany.

Maintenance of the war economy demanded cuts in standards of living, yet the people adjusted themselves to the new environments so well that they were not required to make any appreciable reduction in this respect.

The author has based this account mainly on official documents. He does not refrain from frequently mentioning names of persons who were associated with the events described by him, many of whom are still living and who in some cases may not appreciate his observations about them. The work has a number of illustrations, mostly cartoons, and some maps and diagrams which provide useful breaks at intervals.

H. R. G.

MAN OF EVEREST

JAMES RAMSEY ULLMAN

With illustrations

George G. Harrap, London, 18/-

I must confess that I approached this book, as a reviewer, with some prejudice. The land of the dollar and competitive enterprise, I felt, had not failed to capitalise on a wonderful feat. That an American novelist

too and not a biographer had undertaken the task of setting down, in print, Tenzing's life did not help to take the edge off this approach. I could hardly have been more mistaken and I am not disappointed that I was.

In the field of human endeavour there are many with "firsts" to their credit, who shine for a time and are then forgotten, but the magnificent effort of Tenzing and Hillary, who were the first to reach the summit of Everest in 1953, will be remembered as long as there are high mountains and men to climb them. Of his subsequent visit to Mont Blanc Tenzing says, "On the day we were at Chamonix it was so crowded with climbers that it looked less like a mountain than a railway station." It will be some time before such a state is reached on Everest, if it ever does. Till then, Tenzing's feat must remain an epic of high adventure.

Tenzing was born in Khumbu, in North-Eastern Nepal, in the Sherpa tribe who dwell in the high uplands of the Eastern Himalayas. It is their birth, childhood and Spartan existence, lived at high altitudes, that have made the Sherpas so sought after as high altitude porters by expeditions to the Himalayas. They carry bigger loads farther and higher than any other men in the world. In the case of Tenzing long before reaching fame on Everest, he had acquired a reputation as a climber and as a Sirdar of Sherpa porters, and had accompanied expeditions as far from Toong Roong Busti and his native Darjeeling as Garhwal and distant Chitral. His was no overnight rise to fame. For eighteen years before the conquest of Everest, Tenzing had accompanied expeditions to one or another of the famous peaks in the Himalayas, either to climb them or to survey them. As a Sirdar of Sherpa porters he accompanied Professor Tucci to Lhasa in 1949, in search of a 2,000 years old Sanskrit manuscript. A devout Buddhist it is not difficult to see that his journey to Lhasa, the Holy City, meant more to him at the time, than reaching the summit of Chomolungma, the Sherpa name for Everest.

The outbreak of the last war found Tenzing in Chitral where he had gone with an expedition to climb Tirich Mir in the Hindu Kush Range. He later toyed with the idea of joining up and finally did the next best thing, he joined the staff of the officers' Mess of the Chitral Scouts.

The book portrays a cheerful and likable personality, unspoilt by fame. It reveals the Sherpa courage and the fact that more Sherpas have perished on expeditions than the Himalayan climbers of all nations together.

It gives, in interesting detail, the story of Tenzing's successful climb with Hillary to the summit of Everest. It also discloses how this magnificent feat was exploited by politicians for their own purpose. There has been speculation in some quarters as to who actually reached the summit first, whether it was Tenzing or Hillary. To those who know the value of the team spirit in mountaineering such a question would not arise.

H.L.F.

ALPS AND ELEPHANTS

HANNIBAL'S MARCH

SIR GAVIN DE BEER, F.R.S.

Geoffrey Bles, London, 10/6

The author claims that solving puzzles is his profession as a scientist and his hobby as a historian. In this book he has undertaken to solve the puzzle as to which route Hannibal used when he crossed the Alps. He has drawn on a vast amount of scientific data and historical facts to help him in this task.

From the earliest times Hannibal's route over the Alps has exercised the minds of scholars. This book is a very convincing contribution to the subject.

Sir Gavin has carefully analysed the writings of Polybius and Livy in order to arrive at his deductions. In this he has avoided the mistakes of previous writers on the subject who have been content to base their investigations on earlier scholars of repute. Which is the river "Skaras" referred to by Polybius in his 'Histories'? To add to the confusion the same river has been called by Livy "Arar". A number of earlier writers identified this with the river Isere by the affinity in the names.

The author's etymological deductions are very convincing when he asserts that the river in question is the present Aygues. With this as the basis, he has deduced that Hannibal crossed the Rhone between the present Fourgues and Arles. Thereafter Hannibal marched north along the Rhone and turned right at the confluence of the Drome and Rhone. He commenced his ascent of the Alps by the Col de Grimone. From this place, according to the author Hannibal made for the Durance River and crossed the Alps by Col de la Traversette.

In arriving at this route the author has taken into consideration physical geography relating to the rivers of Southern France and the climate of the area as it would have been in 218 BC.

It may be noted that the route suggested is a departure from most of the views previously held. Of interest is an appendix showing where a few other writers have made Hannibal go.

Did Hannibal use Indian or African elephants is the next question discussed. From an examination of certain coins of the period and excavations it is deduced that Hannibal used African elephants with at least one Indian elephant.

These opinions have been arrived at after an obviously exhaustive research on the subject. A vast amount of erudition has been condensed within the 115 pages of this book which will be welcomed by scholars of military history.

J.N.

CORRESPONDENCE**LIEUTENANT GENERAL W.D.A. LENTAIGNE**

LIEUT-GENERAL E.N. GODDARD, C.B., C.I.E., C.B.E., M.V.O., M.C.

Home Office Civil Defence Department,
North Western Regional Office,
Manchester, 20, England.

I refer to Page 268 of your July-September, 1955, Journal, which has just reached me—obituary of Lieutenant General W.D.A. Lentaigne.

In this notice reference is made to Joe Lentaigne's prowess as a leader of men and soldier, and his success as a Chindit in the last war is mentioned as bearing testimony to his achievements on the battle-field. Might I make reference to what I, from first-hand knowledge, consider to be by far Lentaigne's finest example as a fighting soldier?

In the first Burma campaign between January and May, 1942, Lentaigne commanded a battalion of the 4th Gurkha Rifles in the 48th Brigade of the 17th Indian Division during the fighting between Moulmein and the Irrawaddy near Mandalay a distance of some 500 miles. During this time and over this distance Lentaigne on many occasions actually led his men in assault action and himself engaged several times in hand to hand combat with the Japanese. The type of country was largely jungle and therefore the fighting took the form of cheek by jowl encounters. How Lentaigne was not killed in one these small actions fought on many occasions, only God knows. It is no exaggeration to say that he was a modern Bayard in this time of defeat. I say defeat but Lentaigne was never defeated. Throughout my entire service I have never met an officer of greater physical courage in the face of the enemy at close quarters.

Forgive my writing somewhat at length but the impression Lentaigne made on me at the time was great; and the impression still is great.

"INDIA AND THE CRIMEAN WAR"

MAJOR O.D.P. RATNAM

The Central India Horse

In the article on 'India and the Crimean War' by Lieut-Colonel M.E.S. Laws (July-September issue), mention is made of Lieut-Colonel W.F. Beatson, of the Bengal Army, who commanded the Corps of Bashi Bazooks as a Lieut General in the Turkish Army. I am sure the officers of our Indian Cavalry, now the Armoured Corps, would be interested to know more about this Lieut Colonel W.F. Beatson.

After the Crimean War, Lieut-Colonel William Fergusson Beatson of the 65th Bengal Infantry, a 55 year old veteran of 38 years' service, came to Hyderabad on 12 February 1858 with orders from the Government of India to raise two regiments of Irregular Cavalry and to make them fit to take the field in six months' time. In this he succeeded. The two regiments were up to strength in a few weeks' time and were called Beatson's Horse.

This officer, although originally he belonged to the dismounted branch (the present Armoured Corps officers would have called him a 'convertee'), was a horseman. He had already made a name in the Nizam's Cavalry and had commanded a Corps of Bashi Bazooks. Weighing more than 200 pounds, the 55 year old man surprised his officers with his energy. He was on horseback every morning before day-break, and to meet emergencies, invariably carried biscuits and raisins in his wallet. He always said that "in countries where saddles were never taken off, except to clean the horses, sore backs were unknown." As a point of interest, the uniform of his force was green with red turban and kamarband. The main weapon was the curved sword.

Beatson relinquished his command in September 1859 to command the Allahabad Division and, soon after, Beatson's Horse was amalgamated with Mayne's Horse, another Irregular Cavalry in Central India, to form a brigade of Irregular Horse under the command of Mayne. This force was meant for service ordinarily in Central India but, on emergency, for service anywhere in or out of India. Due to an unfortunate incident, Mayne was removed from command and his name was deleted from the title of the Regiment, which was renamed 'The Central India Horse'. Later on, in November 1860, Meade's Horse, another Irregular Horse,

was also incorporated into the Central India Horse. Thus, the Central India Horse, the juniormost Cavalry Regiment in the Indian Army, came into existence.

"STUDIES IN THE ART OF WAR"

AN ACKNOWLEDGEMENT

MAJOR-GENERAL B.M. KAUL

H. Q., U. P. Area, Bareilly.

Parts of pages 114, 115, 117 and pages 118 to 120 in my article 'Studies in The Art of War' published in the USI Journal for October 1954 were from Captain Liddel Hart's "Strategy: The Indirect Approach." Assistance was also taken from the book 'Rommel' by Desmond Young. To both these authors I owe grateful acknowledgements.

SECRETARY'S NOTES

Lectures

The following lectures were held in the last quarter of 1955 :—

“ States Reorganisation ”,

by Mr. K.M. Panikkar

17th November 1955

“ Some Aspects of Personnel Administration ”,

by Mr. S.B. Bapat, ICS

19th December 1955

Elections to the Council

The names of the twelve elected members of the Council for 1955-56 are given on the first page of this issue.

Gold Medal Essay 1955

The results of this competition, for which seventeen entries were received, were as follows :—

Winner — Major V.P. Naib, Artillery — Gold Medal

Runner-up — Major M.R.P. Varma, Dogra — Rs. 200

Subscriptions

Subscriptions are payable in advance, *i.e.*, at the beginning of the financial year of the Institution which is from January to December. Members are advised that annual payments made through bankers' orders will obviate the need for reminders.

Changes of Address

It is important that members and subscribers notify any changes of address to the Secretary's Office. A printed form is given elsewhere in this issue for this purpose. Please make use of it.

New Members

From 1st July to 30th September 1955 the following members joined the Institution :—

AHUJA, Pilot Officer D.K., I.A.F.

AJIT SINGH BAGGA, Lieut., 7 Light Infantry.

ALI KHAN, Captain A.M., A.M.C.

ALLEY, Pilot Officer A.D., I.A.F.
AMBEGAONKAR, Pilot Officer N.S., I.A.F.
AMBROSE, Major A.J., Artillery.
ANAND, Brigadier L.S.
*ANAND, Lieut. P.N., A.S.C.
ARORA, Pilot Officer N.S., I.A.F.
ARYA, Lieut, O.P., A.M.C.
BAGCHI, Pilot Officer B.D., I.A.F.
BAKSHI, Pilot Officer G.S., I.A.F.
BAKSHI, Pilot Officer K.K., I.A.F.
BAKSHI, Pilot Officer V.R., I.A.F.
*BALBIR SINGH RANDHAWA, Captain, 7 J & K Militia.
BALDEV SINGH, Pilot Officer, I.A.F.
BAMRAH, Captain N.S., A.M.C.
BARACH, Captain K.M.K.S., Deccan Horse.
BARGOTRA, Lieut-Colonel T.R., A.M.C.
BASSI, Pilot Officer J.S., I.A.F.
*BEDI, Captain Tikka M.H.S., Artillery.
BEHL, Pilot Officer M.L., I.A.F.
BEHL, Lieut. S.K., Artillery.
BHADKAMKAR, Pilot Officer B.B., I.A.F.
BHAGAT SINGH, Lieut., Artillery.
BHANDARI, Lieut. A.K., Artillery.
BHANDARI, Lieut. S.P., A.S.C.
BHARDWAJ, Pilot Officer R.N., I.A.F.
BHARGAVA, Lieut. M.S., E.M.E.
BHASIN, Pilot Officer S.L., I.A.F.
BOSE, Pilot Officer M.M., I.A.F.
CARLILL, Vice-Admiral S.H., C.B., D.S.O., R.N.
CHANDWALKER, Major T.G., Artillery.
CHATURVEDI, Group Captain M.S., I.A.F.
CHOPRA, Captain Lov, Skinner's Horse.
CHOPRA, Pilot Officer O.P., I.A.F.
DANI, Captain Y.R., A.M.C.
DAYAL, Pilot Officer P., I.A.F.
DESAI, Pilot Officer S.P., I.A.F.
DHAWAN, Pilot Officer C.K., I.A.F.
DILBAGH SINGH SIDHU, Lieut-Colonel, 3 Sikh L.I.

GANPAT SINGH, Major, Jat Regiment.
GHAFF, Major M.L., A.M.C.
GHARAYA, Captain J.S., Bihar Regiment.
GHOSE, Lieut.-Colonel R.B.
GILL, Lieut. B.S., N.C.C.
*GILL, Major P.S., Artillery.
GOMATHINAYAGAM, Captain S., N.C.C.
GOYAL, Captain R.P., R.V.F.C.
GUPTA, Lieut. V.P., Artillery.
GURDEV SINGH, Major, 9 Gorkha Rifles.
GURDIAL SINGH, Pilot Officer, I.A.F.
HARBANS SINGH, Lieut., 7 Light Cavalry.
HARNAM SINGH, Major, R.V.F.C.
HINGORANI, Pilot Officer G.V., I.A.F.
JAYAGOPAL, Pilot Officer R., I.A.F.
JAYAL, Pilot Officer B.D., I.A.F.
KAK, Lieut.-Colonel B.N., Hodson's Horse.
KALIA, Captain H.L., E.M.E.
KAPUR, Captain G.S. Skinner's Horse.
KAURA, Pilot Officer P.D., I.A.F.
KOHLI, 2/Lieut. K.V., Skinner's Horse.
KOTHAWALLA, Pilot Officer R.B., I.A.F.
KRIPAL SINGH, Captain, A.O.C.
MAN MOHAN NATH, Colonel.
MASSEY, Pilot Officer E.P., I.A.F.
MATHEWS, Captain M.R., Artillery.
MCAULIFFE, Major R.P., N.C.C.
MEHRA, Captain K.C., A.O.C.
MEHRA, Flight Lieut. S.K., I.A.F.
MENDONCA, Captain P.
MISRA, Captain Y.P., A.O.C.
MOTWANI, 2/Lieut. H.C., E.M.E.
MUTALIK, Pilot Officer V.G., I.A.F.
NANDA, Captain R.C., Artillery.
NANDA, Pilot Officer R.K., I.A.F.
NARASIMHAN, 2/Lieut. M.R.L., E.M.E.
NARJIT SINGH, Captain, 7 Light Cavalry.
NAYYAR, Major R.K., Artillery.

NEGI, 2/Lieut. N.S., 7 Light Cavalry.
NIRMAL SINGH, 2/Lieut., E.M.E.
OPAL, Captain S.S., Artillery.
PARANJPE, Pilot Officer S.R., I.A.F.
PARMAR, Lieut. V.S., Madras Regiment.
PARMINDER SINGH, 2/Lieut., Raj. Rifles.
PATHAK, Pilot Officer N.K., I.A.F.
PILLAY, Lieut-Colonel V.N., A.O.C.
PIRDAN RAM, Major, 2 MP Bn., N.C.C.
PRAKASH, Pilot Officer S., I.A.F.
RAGHUBIR, Major S.C., Scinde Horse.
RAI, Captain B.K., Signals.
RAINNA, Major M.N., 7 J & K Militia.
RAJENDRA SINGH, Captain, 7 Light Cavalry.
RAJWADE, Captain G.V., Signals.
RAJWADE, Lieut.-Colonel M.R., M.C., Engineers.
RAMACHANDRAN, Pilot Officer P.M., I.A.F.
RAMAKRISHNAN, Captain M.A., Maratha L.I.
RAMINDAR SINGH, Pilot Officer, I.A.F.
RANA, Major G.D., Garhwal Rifles.
RATHORE, Lieut. N.S.
RAVINDRA SUKHIA, Captain, 7 Light Cavalry.
RAY, Pilot Officer M.S., I.A.F.
SADANAND, Pilot Officer M., I.A.F.
SAIGAL, Captain J.R., Artillery.
SANYAL, Pilot Officer A., I.A.F.
SAPRE, Pilot Officer A.K., I.A.F.
SAPRU, Pilot Officer A., I.A.F.
SATWANT SINGH, Pilot Officer, I.A.F.
SEN, CAPTAIN S., A.O.C.
SENGUPTA, Pilot Officer D., I.A.F.
SETHI, Pilot Officer N., I.A.F.
SEWAK SINGH, Lieut-Colonel, Artillery.
SHAHANI, Captain B.B., A.O.C.
SHAMSHER SINGH, 2/Lieut., 7 Light Cavalry.
SHANKAR, Captain (E) D., D.S.C., I.N.
SHARMA, Captain V.N., 16 Light Cavalry.
SHEORAN, Major R.S.
SIMPSON, Pilot Officer D., I.A.F.

SINGHA, Major R.K., Garhwal Rifles.
SINHA, Pilot Officer R.K., I.A.F.
SODHI, Lieut.-Commander S.S., I.N.
SOORMA, Pilot Officer H.S., I.A.F.
SUBIA, 2/Lieut. C.R., Skinner's Horse.
SURI, 2/Lieut. A.L. Engineers.
THAKUR, Pilot Officer A.T., I.A.F.
THAKUR, Pilot Officer. S., I.A.F.
THAKUR, Lieut. T.D., 7 J & K Militia.
THIMAYA, Major N.G., Artillery.
THUMBY, Captain R.N., 8 Cavalry.
UJAGAR SINGH, Captain, Engineers.
VARMA, Pilot Officer R.K., I.A.F.
VARIOR, Captain, N.V.S., A.M.C.
VENU GOPAL, Captain H.C. Maratha L.I.
VERMA, Pilot Officer V.K., I.A.F.
VIDYASAGAR, 2/Lieut. P., E.M.E.
VIJAYAN, Pilot Officer T., I.A.F.
VIRMANI, Lieut. R.C., Hodson's Horse.
WALIA, Captain H.R., A.S.C.
WHIG, Major M.M., 2 Sikh L.I.
ZACHARIAH, Lieut.-Colonel J.P., A.M.C.

SUBSCRIBING MEMBERS

Twelve Officers' Messes and Units were enrolled as subscribing members during this period.

ESSAY COMPETITION**GOLD MEDAL PRIZE ESSAY COMPETITION, 1956**

The Council of the Institution has selected the following subject for the Gold Medal Essay Competition for 1956 :—

"A truly national army recruited without reference to areas, regions and classes can be a great instrument to secure cohesion. In all multi-lingual countries the armed forces have always been a precious crucible for the transmutation of provincialism into an integral nationalism."

Geographical Factors in Indian History,

by K.M. Panikkar (Page 91)

Discuss the validity of this statement with special reference to the armed forces in India.

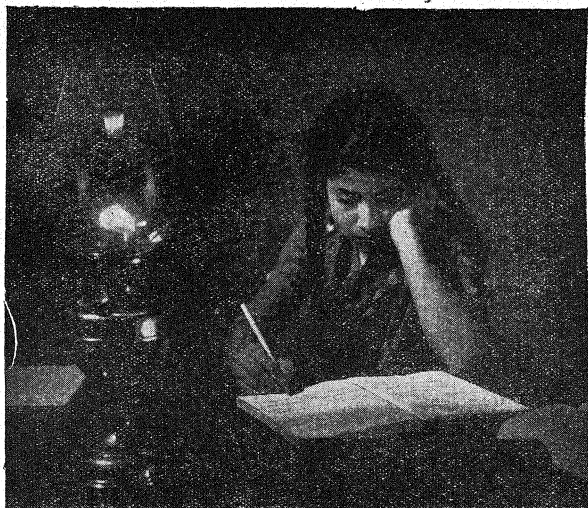
Entries are invited from all Commissioned Officers of the Armed Forces of India, the United Kingdom and other Commonwealth countries, officers of the Territorial Army and the Senior Division of the National Cadet Corps and gazetted officers of the Civil Administration in India. They should be typewritten (double spacing), submitted in triplicate and be received by the Secretary, United Service Institution of India, Kashmir House, New Delhi, on or before 31st July 1956.

Entries will be strictly anonymous. Each essay must have a motto at the top instead of the author's name and must be accompanied by a sealed envelope with the motto outside and with the name and address of the competitor inside.

Essays may vary in length between 4,000 and 8,000 words. Should any authority be quoted in the essay, the title of the works referred to should be given.

Three judges chosen by the Council will adjudicate. They may recommend the Gold Medal to the winner and/or a cash prize, as well as a cash prize to the runner-up (subject to the sanctioned limit of Rs. 700 in all for prizes) and will submit their decision to the Council. The name of the successful candidate will be published in the October 1956 issue of the *USI Journal*.

Copyright of all essays submitted will be reserved by the Council of the United Service Institution of India.



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IN INDIA'S LIFE AND
PART OF IT**

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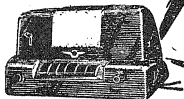
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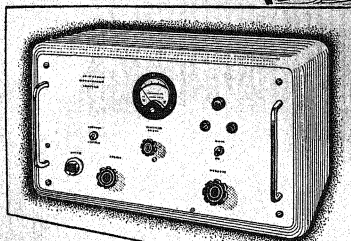
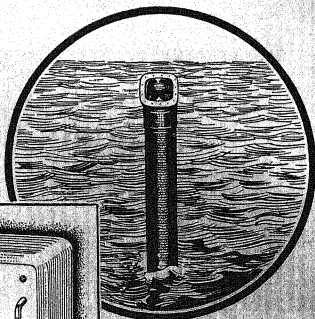


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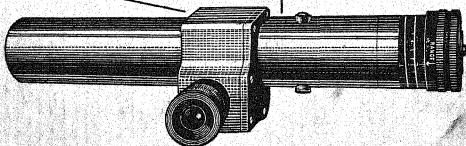
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